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TELEPHONE MEN.

XXXV.—RICHARD CHARLES BENNETT.

RICHARD CHARLES BENNETT was born in London in 1857 and educated at the Birkbeck Schools, Camberwell.

He left school at an early age to enter commercial life, but it was not until October, 1884, he entered the service of the old National Telephone Company, being appointed Inspector at Inverness. Here he had experience not only of ordinary telephone work but also of the erection of a fire alarm system for the Corporation, and the laying of a subaqueous cable across the Caledonian Canal.

When the Carlisle Exchange was under construction he was temporarily transferred thither for the purpose of fitting up the switchboard and switchroom. In those days switchboards were not supplied complete, ready to be screwed to the floor and to take the connecting wires as at present, but were built up by the staff from parts supplied, usually by several different makers. Pioneer telephone electricians were therefore compelled to be thorough to the most minute details.

He was promoted to be District Manager at Inverness at the end of 1885, and it was under his management that the first steps were taken to extend the telephone northwards to Dingwall and Strathpeffer.

In 1886 he was transferred as District Manager to the newly created Border district. He transacted all the preliminary business here, and opened the exchanges at Galashiels and Selkirk, and the junction line between them. In the opening of these exchanges the total wayleave rental involved was 4s., this being paid to one man.

On the death of Mr. Townsend, the District Manager at Kirkcaldy (which had recently been made the headquarters for Fife and Stirlingshire), Mr. Bennett was transferred as Manager to this more important district, but had only been there a few weeks when the managership at Nottingham becoming vacant he was selected for that post by Colonel Raynsford Jackson, the then Chairman.

Mr. Bennett found Nottingham no sinecure, for, in addition to a chaotic local service and a fire alarm installation that kept the brigade from rusting by a never-ending succession of false calls, there was urgent necessity for re-organisation in the switchroom, office and stores department, and, moreover, the subscribers were in constant need of soothing treatment. The exchange at that time was situated in Old Bottle Lane, the switchboards being of the flat type with the old-fashioned Gilliland type of indicators. Shortly afterwards it was removed to Thurland Hall and fitted with multiple Western Electric boards. One of the earliest Patterson cables was laid by Mr. Bennett to the new Guildhall, and the first underground dry-core cable scheme in Nottingham was carried out under his supervision.

Mr. Bennett carried out the construction of trunk lines to Leicester, Northampton, Mansfield, Derby and to the Chesterfield boundary of the district, and the opening of exchanges at Leicester (where the Post Office were already firmly established), Mansfield, Beeston, Newark, Ilkestone and Hinckley. The opening of the exchange at Leicester by the present Vice-President, Mr. S. H. Sands, then Mayor of Nottingham, being made the occasion of a banquet to the principal Corporation officials and citizens.

In 1896 Mr. Bennett was transferred to Sheffield in time to undertake the looping of the whole of the subscribers' lines in the district; the extension of the underground work in Sheffield (consisting at this time of 50 and 75-pair bituminous and four-wire gutta percha cables, all of which have since been substituted by larger dry-core cables); the installing of underground work at Chesterfield, Barnsley, Worksop and Doncaster.

The revenue and stations in the Sheffield district have more than trebled since 1896, and in addition four sub-exchanges in Sheffield and exchanges at Silkestone, Royston, Woodhouse, Hoyland, Darley, Bolsover, Staveley, Wirksworth and Bawtry have been opened.

Mr. Bennett completes 25 years' service with the present year and practically 24 of these have been as District Manager in various parts of Scotland and England.

Like other officials of the Company he has a liking for sports—cricket, football and golf being amongst those he has participated in. He was for many years playing both cricket and Rugby football with the Old Buxtonians in London, whose headquarters were at Upton Park, Essex. Whilst an enthusiastic cricketer (taking active part in the team at Nottingham and being at the present time president of the Sheffield team) his latest love is golf, which he finds very beneficial in aiding him to maintain a good constitution.

THE ROMANCE OF TELEPHONY.*

"Romance is the Poetry of Literature."—MADAME NECKER.

BY G. H. SARGEANT, *Leeds.*

WHAT is romance?

Our first impressions are that it is a term restricted to the ages of chivalry, to the life of pastoral poetry, to classical times. A time connected with the wild and wonderful, adventurous and strange, unusual and distant, far removed from the deeds and days of real life. What we conceive of as romance is simply unlikeness to our surroundings, environment, times. We walk amidst the ruined cloisters of the old abbey, the wind whistles down the aisle, sighs over its grass-grown courts. "Ah," we say, "romance was here amidst cowled forms, romance followed those echoless feet from pillar to pillar." And we forget it was to them an unvarying and monotonous existence, life set in a rigid and iron rim and ring of circumstances.

Or we seek out the old castle ruins. We go from moat to keep, from turret to dungeon. "Here," we say, "here was romance, here a wild life, here an uproar of excitement and existence." But not more so than is the average life of to-day, for he who is "wise" and "will observe" will understand that opportunities and wonders come not once in any age but every day in every age. So then romance is of every day's happening.

What is telephony?

Surely as defined by Shakespeare, that which "Will speak with most miraculous organ"; by Lord Tennyson as "The fairy tales of science and the long result of time"; and by Chas. Reade as "The measure of impossibilities lost in the present age."

Fifty years ago the era of the telephone was dawning. A few years later men began to ridicule and oppose the idea. Only a select number of greater minds could peer into the future when the telephone system would have spread its giant tentacles across the face of many countries. But even they would be astonished could they see what victories have been won, and are still being won in the face of tremendous difficulties. We, on the other hand, have been so accustomed to the use (and abuse) of the telephone as part of our daily life that we are prone to be blinded to the true romance surrounding both the past and present of a great system.

But the science of telephony, "a truly imperial science," to quote a noted physicist, being as it is the product of the most magical of all physical forces contains so much of the unfathomable, the unknowable, that to the distant and casual observer it is a source of wonder, whilst to the true seeker into its mysteries, who plunges into its depths, it is a veritable will-of-the-wisp ever luring on, ever exciting hopes and showing fair positions never fully realised or attained to.

One would like to set this forth more clearly by pointing out at length the mysteriousness underlying the various terms heard every day; of the great propulsive force we call electricity, which though it has been in existence for ages, has only so recently been harnessed and made to do some of the behests of man—that it cannot now be defined in any set terms or finality, being known by the results it accomplishes, obtained only by obedience to the laws governing it; of the primary idea of "power" or "force" which cannot be resolved into more fundamental or elementary conceptions—(if anyone doubts this let he himself try to resolve it. For instance, if a ball is struck or kicked, we see the ball—bat—stick, or leg administering the blow, we see the effect, but we never see the influence communicated, it is invisible as well as intangible)—of magnetism with its antiquity, and its myths; of chemical energy so subtly accomplished and so closely connected with electrical energy. But I think enough has been hinted at to justify the statement, and also to show that, with all its romance, there is in the science of telephony something well fitted (to quote Faraday) "to give man an insight into the actions of some of the laws by which the universe is governed, a knowledge which gives interest to the most trifling phenomenon of nature, and makes the observing student 'find tongues in trees, books in the running brooks, sermons in stones, and good in everything.'"

It is a popular but erroneous belief that great inventions have sprung, full grown and completely equipped from the brains of their inventors as did Minerva from the brain of Jupiter. A closer examination shows that that which impresses us so much by its ingenuity and apparent originality is the result of many steps taken by many investigators, each starting from the position attained to by his predecessor. The history of telephony is no exception to this.

Transmission of speech by the ancient world was very simple. It consisted of but two signals, "A pillar of cloud by day and a pillar of fire by night." All through the ages these pillars of smoke and fire ascended, and were the means whereby men spelt out for one another more or less intelligibly, tidings and warnings. The twinkling light of these fire messages is reflected through all the classic writers. Alexander the Great placed a staff over the royal tent from which signals might be given, fire being used by night, and smoke by day. The watchman waiting for ten long years on the tower of Agamemnon for the light informing him of the fall of Troy is another illustration.

Readers of the *Story of Marco Polo* will find mention of one of the earliest systematic methods of transmitting messages as inaugurated by the famous Kublay Khan. From Cambalue (*i.e.*, Peking) many roads and highways ran to many provinces. At every 25 miles a station existed called a yamb, each being fitted up with everything the messengers wanted. In all there were more than 10,000 stations. Between these at every three miles stood a little fort with 40 houses round wherein dwelt the foot runners. In discharging his duty, every one of these wore a great wide belt set all on one side with bells, so that as he ran the three miles from post to post the bells could be heard jingling a long way off. Thus, on reaching, he would find another ready who, on receiving message, would proceed similarly equipped, and so on to the destination. By this means, messages from places ten days' journey off were received in a day and a night, and if needs be, news from 100 days' journey off in ten days and nights, and the writer asserts "this is no small matter." The clerk at each of the posts noted the time of arrival and departure, and other officers made visitations of all posts and punished those slack in their work. This account of a long-ago age and method has in it the germ of present-day telephony: The central exchange well equipped and manned; sub-exchanges at intervals as necessary; the whole making up a perfectly ordered and arranged system of communication; prompt attention and fidelity to duty on the part of the *personnel;* careful oversight; good management.

Everyone knows how the signals sped in connection with the Spanish Armada, and remembers Macaulay's lines:

> "Far o'er the deep the Spaniard saw along each southern shire,
> Cape beyond cape in endless range those twinkling points of fire."

To almost the dawn of the nineteenth century the old pitch pine voice spoke from hill to hill in tongues of fire the few common messages of mankind.

But men were thinking, and as early as 1583 Francis Godwin, Bishop of Hereford, invented "a secret method of carrying on correspondence quicker than writing." For his pains he was suspected of being in league with the evil one and witches, nevertheless he published a book, entitled *The Mysterious Messenger*, in which he suggested the spiritual world as a medium, and frankly said "it is not easy to employ a good angel nor safe to deal with a bad one."

Shakespeare then made a suggestion of "putting a girdle round the earth in 40 minutes," but gave no hint how it was to be done.

* Abridged from a paper read before the Leeds Telephone Society.

The Marquis of Worcester next tried his hand, and in his *Century of Inventions*, 1655, states he had "invented a method how at a window, as far as eye could discover black from white, a man may hold converse with his correspondent," also he pointed to a way of doing it "by night as well as by day though as dark as pitch was black."

In 1667 Robert Hooke, the reputed inventor of the barometer, wrote, "I have by a distended wire propagated sound to a considerable distance in an instant, and this not only in a straight line, but in one bended at many angles."

Just before the birth of the nineteenth century an innovation for actual spelling out of messages was introduced from France, consisting of semaphore communicating intelligence by movable arms or figures. The actual description of this first reached England in the pockets of a French prisoner, and when known caused much amusement, people talking about and laughing at the idea of setting up poles with crossbars which being swung about were made to talk. A modified form was adopted and erected by the Admiralty. It consisted of six octagonal frames, by changing positions of which, any letter could be made. Soon afterwards 50 houses, forming a chain of posts from London to Deal, were erected. The cost of working these is interesting reading. Two clerks or "look-out officers" for each watch tower at 5*s.* per day each; four men at each station to draw wires and change figures at 2*s.* 6*d.* per day each; a carpenter at each station at 3*s.* 6*d.* per day; a housekeeper; and over all "four riding surveyors for the 50 stations" at £1 1*s.* per day each. By this the Admiralty was able to get a short message to Deal in a few minutes. It was of course useless in the dark and failed in foggy weather.

With electricity a new world was unfolded. Benjamin Franklin was the first to demonstrate that lightning and electricity are identical. The success of his experiment of drawing lightning from the clouds with a kite, in 1752, gave a wonderful impulse to the study. In making this experiment, he was fully aware not only that he risked his life but exposed himself to ridicule in the event of failure.

Thirty-nine years later, in 1791, was born Michael Faraday. He is one of the chief figures in the development of the world's knowledge of electricity, and has been fitly termed "The Father of Electrical Science." Men before him had studied the subject, but the result of their researches were only fragmentary; he, by his multifarious discoveries in such things as magneto-electricity, induced currents, and the voltaic pile, began a great movement, the outcome of which he could not fully have foreseen, and from which have sprung the extraordinary advances made in electrical illumination and applications of the electrical telegraph and of the telephone order.

The first discovery leading towards the telephone was made by Page in 1837, that an iron jar when magnetised and demagnetised at short intervals emitted sound. In a treatise written by M. Chas. Bourselle in 1854, the feasibility of transmission by electric wire of articulate speech was insisted on, he maintaining all that was required being an electric battery, two vibrating discs, and a wire. His first demonstration was too crude to be practical, but if persevered with might have led its originator to a more successful issue.

Philip Reiss, a German electrician, in 1861, exhibited to the Physical Society of Frankfort the first telephone, which was based on Page's discovery. By the rapid magnetism and demagnetisation of an iron wire he produced sounds having the same rate of vibration and the same pitch as a note sung into the transmitter. His first experiment, it is said, was made with a transmitter constructed out of a beer barrel and a receiver modified out of a violin, and it emitted sounds likened to a child's penny trumpet.

The thread telephone so familiar in nurseries was introduced in 1860, and had a wonderful suggestiveness.

Cromwell Varley, in 1870, exhibited the first telephone in England. In this the actions of the common tuning fork was ingeniously employed to make and break the electric current. Seven years later he fixed one end in the Queen's Theatre, Long Acre, London, and the other in a music hall on the Surrey side of the Thames, and melodies were heard thereby on Feb. 12, 1877.

On Feb. 14, 1876, on the same day, with a difference of one hour only, there were put into the American Patent Office independently two inventions of the telephone—the first by Graham Bell, a native of Edinburgh, but naturalised as an American of Boston, the second by Elisha Gray, of Chicago. We are the more nearly concerned with the former, as the telephone we have to-day with all its improvements remains in essence as the invention of Graham Bell. It was whilst teaching deaf and dumb children at Boston, 1859 to 1871, that Bell was led to the discovery of some of the modes by which transmission of sound might be aided by electricity. In devising his instrument he copied the human ear with its vibrating drum. A little piece of clock spring glued to a parchment diaphragm constituted the plate first used by him as a vibrator, and on saying to the spring at one end "Do you understand what I say," the answer came back from the assistant at the other "Yes, I undertand you perfectly." The sounds were feeble, the ear had to be held very close to the spring, yet the words were distinct. Thus he was the first to make a piece of dead matter eloquent. Others had given the electric wire a tongue so that it could mumble like an infant, but Graham Bell first taught it to speak. Introduced into England it looked nothing more important than the handle of a skipping rope, but through it Sir Wm. Thompson listened to Hamlet's soliloquy, "To be or not to be," repeated to him by Professor Watson in a loud clear voice at the other extremity, and pronounced it with enthusiasm to be the "greatest of all the marvels of the electric telegraph."

It was exhibited to the Queen at Osborne Palace on Jan. 14 and 15, 1878, and on the 22nd, an attempt was made to transmit a speech from the House of Commons to the *Daily News* office in Blackfriars.

Much could be said of its subsequent development and the many difficulties to be overcome (*e.g.*, little was known of insulation and there is on record that on one line at least the order was given to cover the wires with tar, and men went forth tar, bucket and brush in hand, and by this method sought to obtain the required insulation); but I forbear; only I would make a brief reference in passing, to the valuable discovery of the microphone by Professor Hughes, which does for the ear what the microscope does for the eye, *i.e.*, renders loud and sonorous what would otherwise be inaudible. Through its agency the delicate step of a fly can be heard like the trampling of a horse. Yet so readily can it be put together that the inventor built up the first one with no costlier materials than an empty match box, a penholder, a bit of sealing wax, and a morsel of string.

I come to the position now attained to.

The telephone is now found in the home as well as the business and private premises—one room speaking to another in the same house, or the house with the office or works; the mistress giving her orders to the cook, or directing the tradesman from her sitting or bedroom; the master instructing the coachman, motorman or manager from his easy chair; friends able to converse together without having to take a journey. The public call office brings it in reach of all—John O' Groats is able to talk not only with Lands End, but Manchester with Paris. In cases of accident in the mine and pit it is the quickest and often the only means of communication between the miners below and succour above. It is now a requisite part of a diver's equipment, being fixed in the helmet within reach of the mouth, so as to keep the hands free. By it balloons communicate with each other and the ground, marksmen with the scorer to learn effect of the shot, ships with the shore. In America it is used for marrying persons at a distance, in consulting doctors, and even in examining the defendant in a lawsuit too ill too attend court. An Arctic explorer even proposed to lay a line along the ice. The ice would be a good insulator and the line a good guide, always supposing it to escape the curiosity of a Polar bear.

By adaptation Professor Hughes has made it so sensible to metals as to tell a bad coin from a good one. Professor G. Bell has adapted it to locate bullets in the body, as he did do in that of President Garfield, and Captain McEvoy to the detection of submarine torpedoes, sunken chain anchors or buoys. From it Mr. Edison has constructed a little voice mill, termed the rotophone, in which a metal plate not only vibrates out and in under the impact of the voice, but at the same time sets in motion a small toothed wheel by an escapement, and thus it can be made to perform work. This is an ingenious method of bridging over words and deeds, and would be a boon, say, to the mother, who by fixing one to a

cradle would cause it to rock as the baby cried, and continue to do so in proportion to the outcry.

I pass on to say, in conclusion, a few words as to the future.

A celebrated Western sage has told us not to prophesy unless we know, and we would be mindful of the precept. But simply taking our stand on what has already been done it is possible to have some idea of the triumphs of the future. It can safely be said the telephone will change the histories of peoples and affect the destines of nations. Think you Napoleon would have lost Waterloo had he its aid and been able to have called up Grouchy and his 30,000 men?

Recently we completed one of those little frontier wars so common to us. On all sides commendation and honours have been bestowed upon the quick and easy accomplishment of what looked to be a severe task. Reading an account of the operations, I came across the words "telephone communication has been established with the front pickets." In this short sentence the explanation of more than a modicum of the success achieved is to be found. Only those who know what outpost duty is, and especially in the country of a wily, savage foe, really understand the effect of the telephone being in such close proximity—the confidence begotten of having a sure friend—the certainty borne of a safe ally—the conviction of victory because of succour and supplies so easily secured.

The linking up of the countries over sea has been very slow hitherto, owing to the enormous difficulties of undersea cable. Some of these are volcanoes, soft vegetable mud, minerals, such as manganese and iron oxides, springs of oil or pitch, etc. There may be something in the suggestion of the lady who wrote to *The Times* recommending that cables be oversea instead of undersea, and suggesting Gibraltar Rock, the Peak of Teneriffe, and the Andes as convenient points of suspension.

An Irishman, on landing in New York, happened to see a diver encased in his suit walk out from the sea, where he had been examining a stranded boat. "Faith," he remarked, "If I had known one could have come over like that I'd have walked across myself." We may never perhaps be able to walk across, but we can reasonably hope to be able to talk across, because not only has present-day skill greatly tamed the tyranny of the ocean, but wireless telephony, though only in its infancy, has before it a glowing future. Already is it installed on two Government ships (H.M.S.'s *Furious* and *Vernon*, and experiments are in progress to establish communication between Lyngby, Copenhagen, and North Shields, a distance of nearly 600 miles.

* * * * *

Time fails me to tell of all its power, its progress and its possibilities. . . . But as away back from the dim and distant past we may see a long line of men reaching up to a time almost linked with the present by the span of a human life, standing patiently by their watch-towers waiting for the spelling out of crude imperfect messages, and as about us to-day their descendants are sending waves of thought around, to be caught up by sympathetic instruments without any visible contact, so without any great stretch of imagination we can think of the coming time when everyone will be able to carry his own "sympathetic" receiver by opening which and applying to the ear he may listen to the gossip of the world, even as the shell picked up on the seashore repeats the whispering music of the ocean, with this difference, he will be able to select from the myriads of ether waves the particular message intended for himself alone.

Authorities for basis of foregoing—

Elements of Science, by St. Geo. Mivart, F.G.S.
Various Forces of Nature, by M. Faraday.
Romance of Electricity, by Jn. Munro.
Romance of 100 years, by Alfred Kingston.
Story of Marco Polo.
Modern Seven Wonders of World, by Chas. Kent.
Romance of Biography. Paxton Hood.
Lives of Faraday, Edison, S. B. Morse, etc. Various authors.
Magazines such as *Chambers' Journal* and various other sources.

BRITISH L. M. ERICSSON MANUFACTURING COMPANY, LIMITED.

MR. W. M. CROWE has been appointed Managing Director in succession to Mr. Hammarskjöld whose death we lately reported.

NOTES ON AN INSTRUMENT FOR THE MEASUREMENT OF SELF-INDUCTION.

By G. M. B. SHEPHERD, *Engineer-in-Chief's Office.*

DURING the last few years telephone engineers have awakened to the fact that besides K.R. and I.R. there is another quantity associated with electric circuits which is assuming a rapidly increasing practical importance. This quantity is inductance. It is rather a tardy awakening, for Mr. Oliver Heaviside twenty years or more ago pointed out with unmistakable clearness that if love makes the world go round, it was equally certain that self-induction kept the telephone current moving; but the powers of the day thought otherwise and matters slumbered on until Dr. Pupin, of America, showed how this peculiar attribute of all conductors could be satisfactorily applied to telephone lines to perform other duties besides that of impeding an electric current. Apart from the question of loaded lines, a knowledge of the self or mutual inductance of all types of telephonic apparatus is indispensable to anyone wishing to have a clear insight into their action, or to make any numerical calculation bearing on transmission.

What follows is mainly a description of an instrument recently constructed at the Company's London workshops for the Head Office Investigation Department, for the purpose of quickly and accurately measuring the self-induction of telephonic apparatus of all sorts, and loading coils in particular, under practical working conditions, that is to say, using currents of the magnitude and frequency of actual speech undulations. This instrument is called a variable standard of self-induction, or inductometer, and is illustrated in Fig. 1. As the requirements could not have been fully

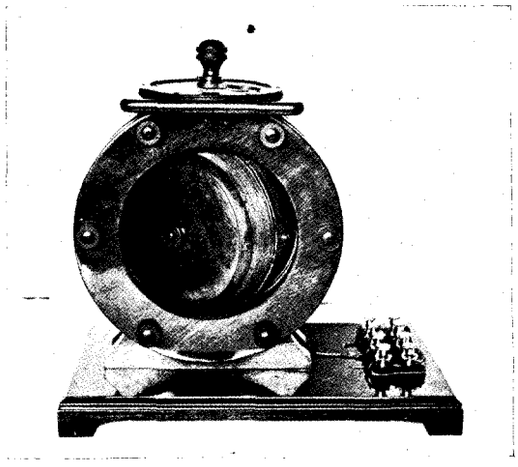


FIG. 1.

met by any standard pattern on the market, it was thought preferable to manufacture the apparatus ourselves rather than purchase from an outside firm.

Construction.—The principle, which the writer believes is due to Professors Ayrton and Perry, is quite simple. There are two circular coils of wire connected in series, an outer fixed coil and an inner movable one. When these two coils, which are mounted about a common vertical axis, are in the same plane, and the winding of each is in the same sense, *i.e.*, produces similar polarity, then it is easy to understand that the whole arrangement will have the maximum possible inductance. When, however, the moving coil is rotated the linkage of magnetic flux becomes smaller, and finally when turned round 180° relatively to the fixed coil so as to oppose it magnetically, the induction is a minimum, and could indeed be *nil* were it possible to construct a pair of coils identical electrically, and so close that all the lines of force generated by one coil would be interlinked with the other. Of course this is impossible for mechanical reasons, and practical inductometers can only vary from a maximum to a minimum inductance with a range of perhaps ten times.

The coils of the instrument in question are shown sectionally in Fig. 2. For convenience in mounting and winding, both outer and inner are made in two sections with a wooden flange 1·5 centimetres thick between them. The outers are former wound and solidified by baking in shellac; the whole structure being held together by wood cheeks having circular grooves to receive the end faces of the "former" coils. The inner coil is wound on a bobbin of lignum-vitæ, and centred on a vertical pivot of ebonite which passes through the central flange of the outers and terminates on an adjustable head with pointer moving over a circular scale divided into 360°.

The wire used is of rather a special nature — viz., 19/40 stranded, each strand separately insulated with silk covering with a lapping of silk over all. This is necessary in an instrument designed for high frequency work, owing to the increase in effective resistance that always takes place in solid wire with alternating currents. For the same reason no metal work of any kind or metal screws have been permitted in putting the apparatus together. It should be noted that the windings both fixed and moving lie on spherical surfaces, which, though it considerably increases the difficulty of construction, enables the air-gap clearance to be cut down to a minimum, and so renders the magnetic "coupling" much closer than it could otherwise be.

Calculation of Co-efficients of Induction.—Before constructing a rather expensive instrument like the above, it was very desirable to

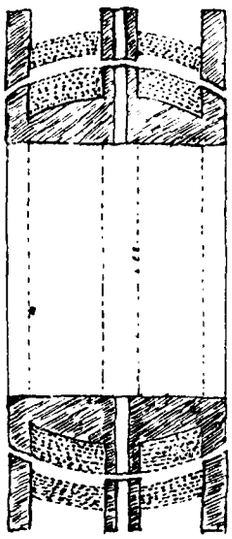


FIG. 2.

predetermine its behaviour, and accordingly the writer made a somewhat extended calculation employing the specified dimensions on the drawings, and assuming the number of turns of wire which for the wire diameter and number of layers fixed upon, appeared probable. As will be seen presently this calculation was not far out.

Theory.—In any good text book on electricity it is proved that if two adjacent coils of wire are connected in series the total co-efficient of self-induction is equal to the sum of the separate co-efficients of each coil, together with twice the mutual induction between them; or mathematically,

$$L = L_1 + L_2 + 2\,M.$$

Now unfortunately we cannot deal with this inductometer so easily, because each coil is composed of two sections separated by an insulating flange about half as wide as the sections themselves, and it is therefore necessary to consider the interactions of four individual coils. The total inductance is given by the algebraic sum of the self-inductances of each section, and the mutual inductances between each section and every other one. The two outer sections being equal to one another, likewise the two inners, this can be written thus:

$$L = 2\,Lo + 2\,Li + 2\,Mo + 2\,Mi + 4\,Moi + 4\,M_D \ldots\ldots (A)$$

where Lo = self-induction of outer section.
Li = " " inner "
Mo = mutual induction between outer sections.
Mi = " " " inner "
Moi = " " " outer and inner sections vertically.
M_D = " " " outers and inners diagonally.

The ± sign indicates the difference between the coils when parallel, and either assisting or opposing, as the case may be.

Formulæ Used.—Inductance is a troublesome thing to calculate at the best of times, and the mathematical expressions are frequently rather terrible to evolve. There are, broadly speaking, three lines along which one can work in determining the inductance of a circuit, thus we may

(1) Total up or integrate the magnetic flux enclosed by the circuit for unit current;

(2) Integrate the electro-magnetic field energy, which for unit current is then equal to half the co-efficient of self-induction; or

(3) Utilise a general vector theorem, called Neumann's formula.

Sometimes one of these methods is best, sometimes another, and very often the task is beyond the powers of the highest mathematician.

The case under consideration is a decidedly awkard one to negotiate, as the coils have a comparatively large cross section, and cannot be treated as mathematical co-axial circles, which is one of the standard forms of inductance. There is also the spherical curvature, though this has been neglected in the calculation, and the coils treated as simple rings or annuli, having a rectangular cross section. There are then two distinct problems to deal with; firstly, the self-induction of annular coils of finite section; and secondly, the mutual induction between various arrangements of same coils, co-axial, but not always equal, or concentric with one another.

The Self-Inductions Lo *and* Li.—The formula used for both of these was

$$L = 4\,\pi\,a\,n^2\left\{\left(\frac{2}{k} - k\right)F - \frac{2}{k}\,E\right\}^{*} \ldots\ldots\ldots (B)$$

where a = mean radius of coil.
n = number of turns.

$$k = \frac{2\,a}{\sqrt{4\,a^2 + R^2}}$$

R is the geometric mean distance (G.M.D.) of every wire in the section from every other wire, and this is given by the following formula approximately:—

$$\text{Log. R} = \frac{1}{2}\log.\left(h^2 + w^2\right) - \frac{1}{12}\frac{w^2}{h^2}\log.\left(1 + \frac{h^2}{w^2}\right)$$

$$- \frac{1}{12}\frac{h^2}{w^2}\log.\left(1 + \frac{w^2}{h^2}\right) + \frac{2}{3}\frac{w}{h}\tan.^{-1}\frac{h}{w} + \frac{2}{3}\frac{h}{w}\tan.^{-1}\frac{w}{h} - \frac{25}{12}$$

where h and w are the sides of the rectangular section.

F and E are the first and second *complete* elliptic integrals to the modulus k, and these functions are to be found in certain books of mathematical tables such as Dale's, for all values of the angle $\theta = \sin.^{-1} k$ from 0° to 90°.

We cannot here go into the theory of elliptic integrals which is somewhat recondite, but a word or two of explanation may not be out of place. F and E are defined by

$$F = \int_0^{\frac{\pi}{2}} \frac{d\,\alpha}{\sqrt{1 - k^2\sin.^2\alpha}}$$

* *Clerk Maxwell*, Vol. II, page 339.—This expression is deduced from Neumann's theorem.

$$E = \int_0^{\frac{\pi}{2}} \sqrt{(1 - k^2 \sin.^2 a)}\, d\, a$$

These intregals are not directly solvable as they stand, but may be expanded in the form of a series of sine functions and then integrated term by term. This has already been done, and the results tabulated as above-stated, so that there is no more necessity to bother about the derivation of these functions than there is to calculate logarithms. The second one is met with when we attempt to find an expression for the length of the perimeter of an ellipse, hence the name elliptic.

Using in formula (B) the specified dimensions of the coil sections which are—

	Outer sections.	Inner sections.
Mean radius ...	9·23 centimetres	7·45 centimetres.
Width	3 ,,	3 ,,
Radial depth ...	1 ,,	1·2 ,,
Turns (nominal)...	330	396

The G.M.D.'s work out to ·95 for the inner and ·9 for the outer sections, and we get for the self-inductions—

$$Lo = \cdot0307 \text{ henry.}$$
$$Li = \cdot0314 \text{ ,,}$$

Mutual Inductions Mo Mi Moi *and* M_D.—The base formula for all these is almost the same as the one last used, (B). It is

$$M = 4\pi \sqrt{a a^1}\, n n^1 \left\{ \left(\frac{2}{k} - k \right) F - \frac{2}{k} E \right\} \ldots\ldots\ldots (C)$$

where $a = 9{\cdot}23$ centimetres.
$a^1 = 7{\cdot}45$,,
$n = 330$ turns.
$n^1 = 396$,,

$$k = \frac{2\sqrt{a a^1}}{\sqrt{(a + a^1)^2 + b^2}}$$

and b is the distance between the central planes of the sections.

Here arises a new difficulty, since the coil sections are of finite area, and not elementary circles as the formula implies. As in the preceding calculation it is possible to find a geometric mean distance between every point in one section to every point in another, but the formula in this case is an appalling one (see Gray's *Absolute Measurements*, Vol. II, page 302) that can scarcely be compressed into a single closely written page of a text book. After inspecting this arrangement carefully, the writer concluded that it was uncommercial, and decided to attack the problem in a different way. The alternative method is an approximation, which however leads to considerable accuracy.

It is called the method of quadratures, and was used by Lord Rayleigh to compute the constants of coils employed in the Absolute British Association Measurements. The theorem is stated as follows:—

If $2h$, $2h^1$ are the radial depths of the two coils.
$2w$, $2w^1$,, ,, widths.
b is distance between centres.

Then M is given by

$$\frac{1}{6} n n^1 \left\{ \begin{array}{r} f(a + h, a^1 b) + f(a - h) a^1 b \\ + f(a, a^1 + h^1, b) + f(a, a^1 - h^1, b) \\ + f(a, a^1, b + w) + f(a, a^1, b - w) \\ + f(a, a^1, b + w^1) + f(a, a^1, b - w^1) \\ - 2 f(a, a^1 b) \end{array} \right\}$$

where $f(a, a^1, b)$, etc., are the results obtained by formula (C) using the dimensions within each set of brackets.

This formula is obviously a kind of average which covers the rectangular sections of the coils. It is rather a laborious business to use it, but one soon gets into the swing of the work, and with a good slide rule and a table of elliptic functions, or the very convenient table given by *Maxwell*, Vol. II, page 346, the various values of M required in this calculation can be run out in a few hours. The figures actually obtained were:

$$Mo = \cdot01245 \text{ henry.}$$
$$Mi = \cdot01180 \text{ ,,}$$
$$Moi = \cdot02065 \text{ ,,}$$
$$M_D = \cdot00958 \text{ ,,}$$

whence by (A)

$$L = \cdot1727 \pm .1209$$
$$= \cdot2936 \text{ henry}$$
or ·0518 ,,

for the two limits of the inductance.

Calibration.—This was done by Maxwell's method of comparison with a standard condenser, and the curve of inductance for various angles ranging from 0° to 180° is shown in Fig. 3.

The higher limit is ·292, which is almost exactly the figure calculated, while the lower limit ·046 is about 11 per cent. under, showing that the true distance apart of the fixed and moving coils is probably somewhat less than estimated, thus giving in reality a better inductive coupling.

By using a single pair of coil sections it was found possible to lower the minimum reading to ·021 henry, and so provide a total range of some fifteen times. This is amply sufficient to cover all the loading coils used, or likely to be used by the Company, and

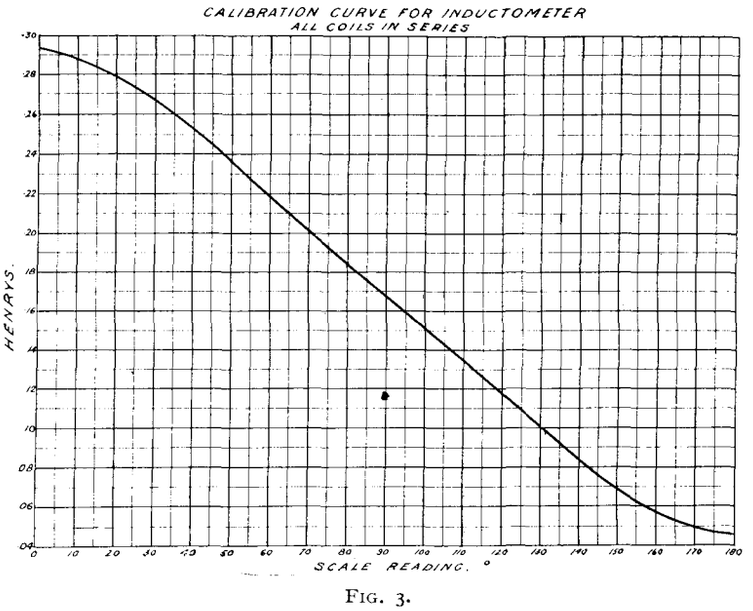


FIG. 3.

also permits measurements of telephone induction coils, receivers, and various other apparatus. For high inductances such as retards, a few constant standard coils to place in series with the inductometer are necessary to bring the total self-induction up to the right order of magnitude for the test.

Concluding Remarks.—In consideration of the fact that no great precision in dimensions was aimed at, that the winding was not exactly known, and lastly, that the calculation, involved though it may seem to be, is not strictly correct for the spherical coil shape, the agreement between theory and practice is very fair. To the Metropolitan workshops, and especially Mr. Ross, the mechanic who constructed most of the instrument, is due considerable credit for making a very good job of a piece of work decidedly off the beaten telephonic track.

POST OFFICE ELECTRICAL ENGINEERS JOURNAL.

The first part of Volume II of the above will be ready on April 1 and there is every indication that the forthcoming volume will be of even greater interest than Volume I. Annual subscription 4s.; sample copies can be supplied at 1s. each and postage. Communications should be addressed to Mr. G. H. Bush, Engineer-in-Chief's Office, Room 31, Telephone House, Victoria Embankment, E.C., who is acting as agent for the Company's staff.

POST OFFICE INSTITUTE OF ELECTRICAL ENGINEERS.

THE following further papers read before the above institution are now obtainable at the prices mentioned:—

"Reply to Criticism of the Murray Automatic Printing Telegraph System." *Donald Murray*..	6*d*.
"The Calculation of Current Values in Networks." J. Lockhart	9*d*.
"The Inspection of Wrought Timber." F. L. Henley	9*d*.
"Protection from Power Circuits." S. C. Bartholomew.. ..	1s.

Application for copies of these should be made with remittance to the Engineer-in-Chief, Head Office.

NOTES ON STAYING POLES.

BY ERNEST A. PEARSON, *Crewe.*

To ensure the stability of a pole route efficient staying is of primary importance. This is especially the case now that lead-covered cables are being generally used for aerial work, so that little apology is needed for a recapitulation of the calculation involved.

Neglecting wind pressure, the stress or "pull" on a terminal pole with wires in one direction only may be obtained by adding together the stress upon each separate wire; or, if the wires are all pulled up to the same tension, by multiplying the stress on one wire by the total number. This will give the working stress on the pole.

The *maximum* stress which may be put upon a pole is, however, the sum of the breaking weights of the wires, which is considerably greater than the above, and this must not be lost sight of.

For a side pull the calculation is not quite so simple. The Post Office method is well known, but will bear describing again.

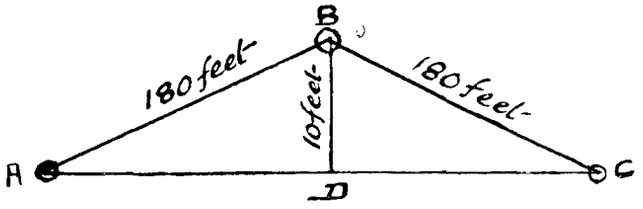
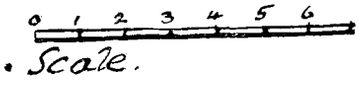


Fig: 1



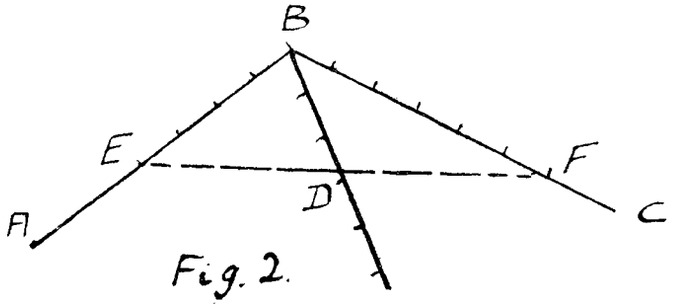


Fig. 2.

A, B, C (Fig. 1) are three poles 60 yards apart, the length of the semi-diagonal B, D (which is practically the side pull on the pole) being 10 feet.

Then the transverse stress on the pole

$$= \frac{\text{total stress of wires in one span} \times \text{length of semi-diag. in feet} \times 2}{\text{length of one span in feet}}$$

The spans are taken as being the same length.

Another method, not so well known, is the graphical one now described—

A, B and B, C (Fig. 2) are two spans of wires meeting at any specified angle. Measure off to scale B, E and B, F proportionate to the stress in each span. Join E, F and bisect at D.

Then twice B, D measured to the same scale as before will equal the transverse stress on the pole. In this case it is unnecessary to know the length of the spans.

To ascertain the stays required it is suggested that the table given below may supply a want. From this table the safe stress on a given $\frac{5}{8}$ or $\frac{7}{8}$ stay may be read off directly for any ordinary height and spread, the figure in columns 3, 4 and 5 being directly comparable with the stress of the wires at the resultant point on the pole.

The stress for any other size stay of No. 8 wire may be obtained by multiplying the figures in column 3 by the number of strands in the stay.

Table showing Safe Stress on $\frac{1}{8}$, $\frac{5}{8}$, $\frac{7}{8}$ Stay Wire at various Spreads.

1	2	3	4	5
Height. Spread.	Multiple for stress.	Stress in lbs.		
		$\frac{1}{8}$	$\frac{5}{8}$	$\frac{7}{8}$
8·0	8·07	88·1	440	616
7·5	7·57	94·1	475	658
7·0	7·07	100·7	503	704
6·5	6·58	108·2	541	757
6·0	6·018	118·3	591	830
5·5	5·59	127·4	637	891
5·0	5·10	139·7	698	977
4·5	4·61	154·5	772	1,081
4·0	4·12	172·9	864	1,210
3·5	3·64	195·7	978	1,369
3·0	3·16	225·7	1,128	1,579
2·5	2·70	263·8	1,319	1,846
2·0	2·24	318·0	1,590	2,226
1·5	1·80	395·8	1,979	2,770
1·0	1·41	505·3	2,526	3,537

Breaking strain, No. 8 = 1,425 lbs.
" " $\frac{5}{8}$ = 7,125 "
" " $\frac{7}{8}$ = 9,975 "
Factor of safety allowed = 2 "

THE PRIVATE BRANCH EXCHANGE AT SELFRIDGE'S, LONDON.

BY A. C. GREENING, *Gerrard.*

THE most popular item of the many displayed in Messrs. Selfridge's new stores in Oxford Street, is undoubtedly the National Telephone Company's switchboard upon the third floor.

A bold innovation was instituted by the firm when they allotted a position for this right out in the open store, in the very centre of the handsome building just completed. A rail serves to separate the operators from the public, and the novel sight of a telephone switchboard operated in the open, attracted at all times a crowd of onlookers standing six to eight deep throughout each day of the inaugural week. So great was the pressure upon the opening day that the rail and its supports were thrown down, and it became necessary to build a barricade of heavy carpet rolls standing upon end, round the switchboard, thereby permitting an adequate view, while preserving the necessary facilities for handling calls. Many onlookers were noted as having stood through periods varying from 30 minutes to one hour, altogether fascinated by telephone operating, any comments they felt impelled to make being made in subdued whispers. This unique method of bringing the public face to face with a little known section of their work provoked considerable interest in the members of the Company's staff present.

The installation comprises three 1-position multiple type private branch exchange switchboards with twenty junctions and some 150 stations, mostly fitted with coin-collecting boxes. The restaurant is equipped with 54 jacks, in any one of which the plug of a pay-station telephone can be readily inserted. The whole scheme indicates in an extremely practical way what an important field for development lies in the direction of shopping by telephone and telephoning by shopping.

Already in London the Army & Navy Stores, Harrod's, Limited, and others, have large installations designed to meet

either requirement, and among leading firms now extending their equipment are John Barker & Company, Kensington, and D. H. Evans & Company, Oxford Street.

The value of such a system to a business house is best illustrated by the voluntary remark recently made to a telephone official by the manager of a large London departmental store, that since adding to the service six months ago and making a special feature of it, the daily average of telephoned orders (for many years an important factor in their business) had increased threefold, and so popular was the practice of telephoning direct from house to counter, that they were finding it necessary to duplicate many of their counter stations.

To gauge the public appreciation of counter pay stations it is only necessary to shake the coin boxes at Selfridge's.

TELEPHONE WOMEN.

XXXVII.—MARY GORDON.

MISS GORDON entered the Company's service at Halifax on Friday, Sept. 23, 1896, and has since then not considered Friday an unlucky day, but quite the reverse. At that time the exchange was in North Parade, the switchroom being in what had previously been a small back bedroom. The switchboard consisted of two 200-line sections, to which about 300 subscribers were connected, suspended Blake transmitters were then used for operating, and the operating staff consisted of a clerk-in-charge and three operators, the clerk-in-charge taking duty at the switchboard all day. The only sub-exchange was then Sowerby Bridge, which has since been closed, the subscribers being transferred to Halifax Exchange in 1899.

Shortly after Miss Gordon joined the service, the exchange was removed to the present premises in Crossley Street, and a new switchboard fitted consisting of one trunk section and three 200-line subscribers' sections. This switchboard has since been extended to provide for 96 junctions and 1,200 subscribers' lines, and work is at present in progress which will bring the number to 1,440. There are at present upwards of 1,170 subscribers connected. The present

MARY GORDON.

equipment is for magneto calling and clearing with hand restoring indicators. The new equipment will be for lamp calling.

Miss Gordon was appointed Clerk-in-Charge in May, 1901, and has served under three local managers. She has a staff of one supervisor and fourteen operators, besides six operators at the five sub-exchanges at Elland, Hebden Bridge, Luddendenfoot, Rishworth and Lightcliffe.

Miss Gordon can only remember one exciting experience. This occurred in July, 1899, when the Halifax testboard was burnt out, the first intimation of the fire being given to the operators by a subscriber on the opposite side of the street to the exchange, who rang up and informed the operator that the building was on fire. The fire was not extinguished until every subscriber had been cut off. The damage was, however, quickly restored and the majority of the subscribers reconnected within 24 hours.

Miss Gordon carries out her duties with a quiet calmness, and with the sincere respect of all her staff.

XXXVIII.—ELIZABETH HARPER.

MISS HARPER joined the Company's service early in 1896, and has therefore been in its employ almost thirteen years. She was at first in charge of the Thornton sub-exchange, where her

ELIZABETH HARPER.

parents resided as caretakers-in-charge, and she in consequence was not new to the business. She therefore readily picked up the duties of an operator, her services proving very satisfactory. She was transferred to the Bradford Exchange in 1898—her sister (who is now clerk-in-charge at Bournemouth, where her brother is also local manager) replacing her. She may indeed claim to have been bred on telephony, for in addition her father was at that time one of the Company's most active and successful canvassers. At the time of her transfer there were only about 25 operators, a supervisor, and a clerk-in-charge at Bradford. Still, the change was great after being solely in charge of the small Thornton Exchange for two years, but shortly after her removal she was made a Senior Operator.

She distinctly remembers the terrible storm in February, 1900, whilst the Company was in the middle of its transfer to the present premises, when practically all the Bradford subscribers were put out of touch with the exchange, and when an operator's duties were more than usually unpleasant. In 1903 the service at the Shipley Exchange needed someone to be placed in charge, and Miss Harper was chosen for the post; she had under her two operators to deal with about 160 subscribers, as compared with four operators and 378 subscribers at the present time.

She finds her work most interesting, is a most careful trainer of juniors, and is now in charge of the new common battery switchboard, the change to which was made on March 20.

SWITCHBOARDS—PAST AND PRESENT.

BY JOHN E. STANTON, *Nottingham Factory.*

IN dealing with this most important branch of telephony I do not propose entering into the subject too deeply from the technical side, but rather to give a general insight into the history of the switchboard, showing by means of photographs and simple diagrams, some of the old types and also some of the present types of switchboards.

As most of you are well aware the telephone is comparatively a modern invention. It was not until 1877 that Mr. (now Sir William) Preece introduced the first pair of practical telephones into the United Kingdom, and subsequently exhibited them before a meeting of the British Association at Plymouth in July of that year. The telephone was first put to commercial use in 1878, and then only between two stations. To make the telephone more practicable and commercially useful it was seen that it must be adapted so that a large number of people could communicate with each other, and this was brought about by means of the switchboard, which, as its name implies, is an instrument for switching one line on to any other that terminates in the same or distant exchange.

Fig. 1 is an actual photograph of "Coleman Street Exchange," which was taken in September, 1879. It has the distinction of

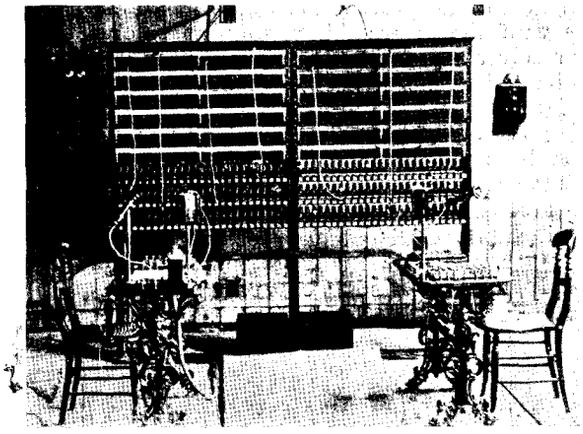


FIG. 1.

being the first telephone exchange opened in London. It was erected by "The Telephone Company," a company subsequently merged in the United, which in turn was amalgamated with the "National Telephone Company."

In this switchboard the indicators were mounted immediately above the slippers, and above the indicators were six cross strips in pairs joined up to connecting keys on the answering operators' table, also in pairs. Three operators were required to manipulate the switchboard, one sitting at each table and another standing to do the necessary switching.

The line wire came in from the subscriber and was joined direct to the indicator, thence to the flat spring jack, or slipper, the term by which they were then known; from this connection was normally made to earth. The switching operator stood in front of the board and, when a subscriber's indicator dropped, took a double-ended cord fitted with a brass peg at one end and a flat jack at the other; the brass peg was then inserted in a hole in the horizontal strip above described and the jack into the slipper, thus connecting the answering operator to the subscriber's line. The operator would then ascertain the number required by depressing one of a pair of connecting keys and call to the switching operator, who would take another cord and make the connection by inserting the peg end into the other of the pair of strips and the other end into the slipper of subscriber required; the operator would then ring the subscriber required by depressing battery key. When an answer was obtained subscriber was told "Through to ——," and having again attracted the attention of the calling subscriber, and informing him that he was through, both keys were held down until conversation started, then released, conversation then being made through a bridging piece.

It will therefore be seen that although this equipment was

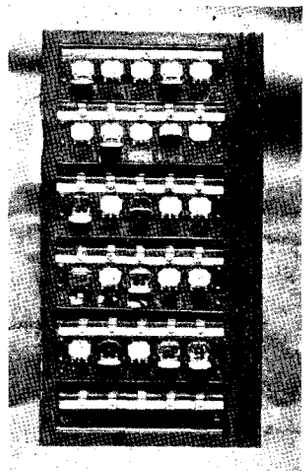


FIG. 2.

termed a switchboard, the actual connections were made through the keys on the operators' table; thus it will readily be seen that the connecting capacity was limited to twelve conversations at any one time. This limitation of capacity was soon felt, with the result that double-ended cords and knife jacks were introduced.

This was practically the commencement of intercommunication, and the thing once being started improvements soon began to follow.

The next improvement was a double-cord board pure and simple. The connection to the operator's instrument was made by means of a knife jack, which was inserted between the line spring and cord jack. This system, although quicker and more elastic as the capacity increased, became extremely noisy owing to the switching operator having to attract verbally the attention of the answering operator; this trouble was overcome by an arrangement devised by the present Metropolitan Superintendent, by which an

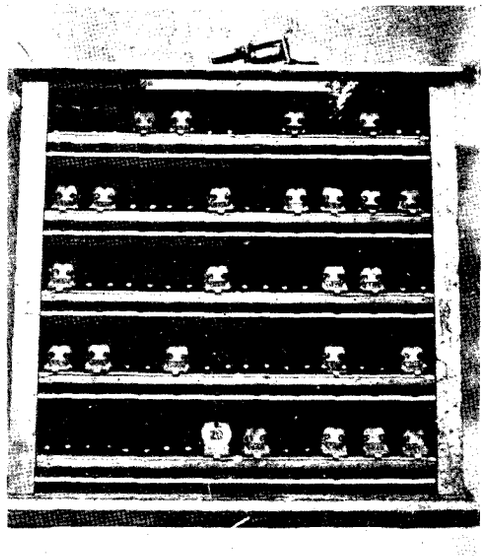


FIG. 3.

indicator, immediately in front of the answering operator, dropped when the knife jack was removed from its socket for the purpose of connecting to a calling subscriber, thus automatically attracting the operator's attention.

Fig. 2 shows an improved form of the slipper board. This is a photograph of a panel taken from a large switchboard, and it will be observed that each line has got a lightning arrester in connection with the jack; that is, an extension of the bottom spring, having a serrated edge bent over at right angles, quite close but not touching the earth plate.

Another type of slipper board was brought out at a little later date (Fig. 3), the most striking feature of which was the indicators. In previous boards one of the chief sources of trouble had been the difficulty of effecting adjustments when necessary. To obviate this a new type of indicator was designed by Mr. Clay, provided with a brass tube fitted on to the bracket of the indicator, a corresponding tube being fitted in the back of the board, into which the tube on the indicator fitted, thus enabling an indicator to be removed from the board for inspection or adjustment.

As a matter of fact, the improved facilities for getting at these indicators were somewhat discounted owing to the very great

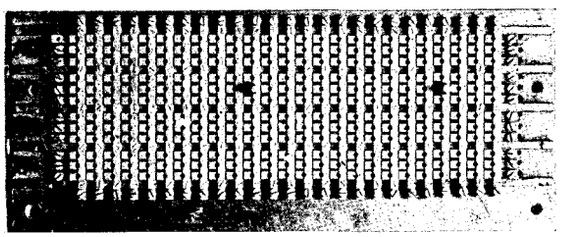


FIG. 4.

improvement in the design of the indicator itself, it was found they seldom if ever required adjustment.

This, by the way, is a system the Americans are now adopting. On the top of the board you will see an indicator which has been removed from its position, No. 6.

Following close on the heels of the various forms of slipper boards came the Edison peg board (Fig. 4 shows one mounted section). This was a very simple arrangement, yet very effective. The line wires were each brought through an indicator and joined on to the line bars which ran straight down the board unbroken. The connecting strips were of a special type, that is, part of the brass was cut away so that the line passed over without making contact. At every junction of the line and connecting strips a hole was drilled half in each strip.

The top horizontal strip was connected to earth, and normally a peg was inserted in each of the 24 top holes for the purpose of earthing the subscriber's line and so completing the circuit. The twenty-fifth vertical strip was connected to the operator's instrument, which was provided with a speaking and battery ringing key, generators at that period not being in general use.

The great advantage over the slipper board was that only one operator was necessary to attend to the calls. The method was as follows:—A subscriber's drop falls, say, No. 21, the operator removes the peg from the earth bar and inserts same in a disengaged horizontal strip, also inserting a peg in the instrument strip on the same row, thus placing his instrument in direct communication with No. 21 subscriber, who says he wants No. 34. The operator then removes the earth peg from No. 34 and brings it down to the same parallel bar, withdrawing for the moment the calling subscriber's peg. He then rings No. 34, and when attention is gained inserts the calling subscriber's peg in same bar, withdrawing the instrument peg, leaving the subscribers through. When conversation is finished the subscribers give a short ring, which drops indicator (this having been replaced), denoting the conversation is finished.

With regard to this board it may be mentioned there was no system of multipling in those days; each operator's position had capacity for 48 subscribers and the positions were known as A, B, C, etc., therefore for the purpose of connecting any two subscribers on the same exchange (not on the same position) sets of three horizontal strips were wired to every other position, thus A board would have three strips to B, C, D, etc., and in the event of, say, subscriber No. 45 desiring to be connected to 291, the operator used to call across the room to the operator at G board in this manner, "291 top A," whereupon (when the demand was heard) the operator at G board would peg down 291 to the A board top strip; the A board operator inserting his instrument peg in the top G strip and so be in circuit with the wanted subscriber; when his attention was obtained, the calling subscriber's peg was brought down to the same horizontal strip and the connection completed. The operator removing the instrument peg was free to "take" another call.

Junction calls, or as they were then termed "through" calls, were operated in a similar manner.

It will be readily appreciated that in a large (!) exchange of, say, 500 lines this system of every operator calling across the room for local numbers, and to the "trunk" or junction operators for their numbers on other exchanges, was not conducive to quiet and smooth working, especially when, as it frequently happened, only one strip was disengaged and the operator to whom you were calling also wanted the strip for an incoming connection; a battle royal would occasionally ensue, which would probably only be settled by an appeal to the clerk-in-charge.

To minimise this trouble, Mr. Sandy, who was then the clerk-in-charge of Mincing Lane Exchange, which was, I believe, the largest exchange built on this principle, introduced the idea of having an operator or boy messenger whose sole duty it was to walk about the switchroom making local connections; this greatly reduced the evil, and as a further improvement on this, eventually speaking lines to the junction operators for outgoing calls were provided. The junction operators had to stand at the board all day holding heavy Bell receivers to their ears with one hand while switching with the other; this was no mean ordeal, but a light headgear receiver had not then been introduced.

This board had the distinction of being the first large cordless board designed.

During the period that this board was in use, the Gilliland board was brought out in competition, I suppose, so that the Edison Company should not have things all their own way. It was worked on exactly the same lines as the peg board, the difference being that it had the Gilliland indicator, and the switching was done by spring plugs. The chief advantage was it could be made much more cheaply, the line bars and connecting bars being pressed out

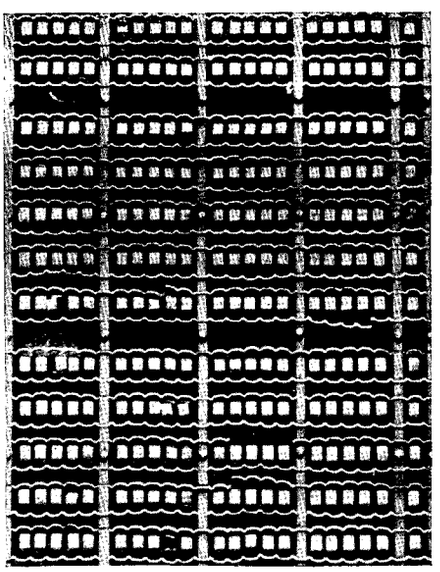


FIG. 5.

of stripped brass instead of being of solid brass as the Edison bars were (Fig. 5).

In the year 1881 Mr. Poole, of the Engineer-in-Chief's Department, invented a small switchboard which was very much used and thought a good deal of (Fig. 6).

Mr. Poole uses the large W. E. indicator, which to us looks a very massive and clumsy type; nevertheless it was a general favourite and very reliable, and has been used until very recently for special purposes in signalling. What is now called the night

bell was also fitted, though I scarcely think it was necessary, as the heavy shutter of the indicator came down with such a bang it could be heard half-way across the street. The line wires were joined to the terminals at the top of the board, and then to the indicators through the switch handles to earth. There were two sets of brass strips running down the board; these are connected across the back, 1 to 1, 2 to 2, 3 to 3 and 4 to 4. The method of operating was very simple. Say, No. 4 drop fell, the operator put lever No. 4 on to one of the brass strips and restored the indicator, then put the reply lever (which was connected to operator's telephone) on the same strip, and got number required from the calling line. If No. 6 was required that lever was put on the same strip as No. 4, which short circuited the two lines. When conversation

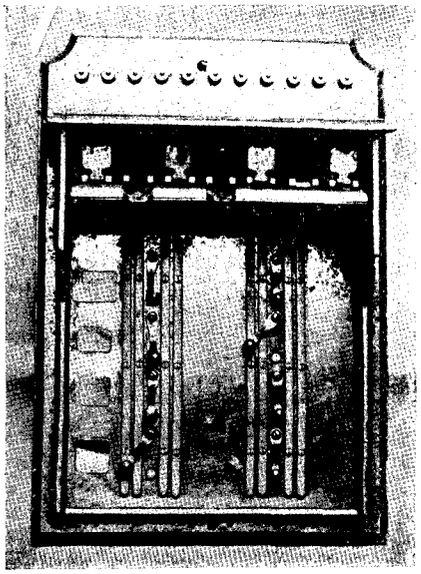


FIG. 6.

was finished the subscriber gave a short ring, which dropped the indicator, and the apparatus was then restored to normal condition. This was quickly improved upon by taking the line direct to the handle, through stud to indicator, and adding a ring-off indicator from the bars to earth, so that when any two stations were conversing the indicators were cut out of circuit.

(To be continued.)

PRACTICAL OPERATING.*

By JESSIE E. FARR.

IT is of the utmost importance that subscribers should be answered quickly—the quicker the better. Subscribers here as a general rule are very good, but all are more or less impatient. It is natural to suppose that this applies to every telephone area. From the first day of an operator's engagement at the exchange it is impressed upon her that to be quick in answering a subscriber, with, of course, civility, is the essence of operating. If, for any reason, the subscriber has to ring twice (and this cannot be avoided occasionally in the busy time), he will often say he has been waiting goodness knows how long. I think some subscribers are of opinion that we read books, or indulge in other recreations, when, as a matter of fact, we are kept continually at work the whole of the time we are on duty. Subscribers who have been to see the operators at work have expressed surprise at the number of calls and the way the board is worked, and have said that they had no idea that the operators had such a busy time. In operating, as in most other occupations, there are a number of humorous incidents, for instance, I remember one subscriber in particular who would ask for a number and, if he did not get a reply at once, would ring again, and in reply to the usual "Number please," would say, "I a'nt 'ad 'um, Miss." The operator would repeat "Number please," but he would only say, "No, Miss, I a'nt 'ad 'um, Miss," and he would keep repeating this until it was explained to him that he had been cut off and must give his number again. The same thing happened nearly every day. Another subscriber, a lady, repeatedly complained of getting, to use her own words, "pistol shots," but she is still alive. To turn from the amusing side it may be well to consider some of the difficulties of operating. These arise from switchboard faults, such as faulty engaged tests, indicators sticking, false lights on junctions, etc. Other troubles are caused through subscribers not using their telephones correctly. Some of them will *not* ring off, others neglect to press the key or spring in the handle of the telephone while they are speaking and cannot make themselves heard, while a few, mostly at hotels and call offices (where there are automatic boxes and where strangers use the telephone), do not know how to put the penny in, and when they eventually do find the slot cannot find the handle to turn that gives us the buzz. All these things make more work for the operator. It is a popular idea with the public that when they ring up on the telephone a bell rings at the exchange, and that the longer they ring the more chance they have of being noticed by the operator. A subscriber once asked if little bells were fixed all round the walls. The idea, from an operator's point of view, is too dreadful to contemplate.

With regard to indicator markings, I respectfully suggest that it might be an improvement if the markings were transferred to strips above the jacks, in a similar way to the party line code board, so that each subscriber has his service shown immediataly above his jack. The indicators would then be left white and could be more easily seen by the operators.

* Abridged from a paper read before the Cheltenham Telephone Society, Nov. 17.

NATIONAL TELEPHONE PROGRESS.

DURING the past month new exchanges have been opened at Bramhall (Cheshire) in the Oldham district; Sedgwick (Westmoreland) in the Barrow district; Wyvenhoe (Essex) in the Ipswich district; and Holytown (Lanark) in the Hamilton district. An exchange at Duns (Berwick) will be opened very shortly; 1,971 stations were added during February, making a total of 479,885.

Great Yarmouth.—On March 4 the Company's exchange was transferred to Telephone Buildings, Howard Street South, a new central battery switchboard being brought into use, superseding an old magneto ring-through system without multiples. The new underground work was also brought into use at the same time. The change-over was accomplished very quickly, and a most satisfactory service was given immediately.

THE SONG OF THE "WIRELESS."

High,
Up in the air I fly,
No slave of the tautened wire am I
And winged words I bear on high.

Low,
Deep in the earth I go.
And men above, as they feel me, quake.
Earth's very foundations I shake, I shake.

Wide,
Wide on every side
Wherever men have lived, or died.
On the waves of the air I ride, I ride.

Swift,
Swift o'er cloud and rift.
Swifter than sight, from lip to lip,
From shore to shore or ship to ship.

Free,
Free as the boundless sea.
Ye have harnessed my mates but I shriek aloud
Me, not yet, have ye tamed and cowed.

E. M. B.

The National Telephone Journal.

"BY THE STAFF FOR THE STAFF."

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VOL. IV.] APRIL, 1909. [No. 37.

THE STUDY OF TRAFFIC.

AT this period of the year a considerable number of the members of the staff look forward to receiving an intimation of the date of the Annual Meeting of Officers, and of the subjects to be discussed thereat. Those members who are invited to attend the meeting will already have had a notification that the selected days are May 20 and 21, and that the subject of discussion will be "Traffic and Traffic Organisation." This is a subject of great interest to every single member of the staff of the Company, and, as is so often the case with telephone problems which these annual meetings endeavour to solve, one which appeals to circles extending far beyond the comparative few actually in attendance. As traffic represents in a concrete form telephone service, the actual product which the Company sells to the public, operator and clerk, contract officer and inspector, engineer and electrician alike should be alive o its importance.

The problems connected with the study of traffic have never aken such a prominent position in this country as they have occupied in the United States of America, and the choice of the subject this year is an indication that the Company proposes to bring into even greater prominence than at present a question which, if properly handled, should result in increased efficiency of the service, and at the same time in a decrease of working expenses.

It is an open secret that during their visit to the States last autumn both Mr. GODDARD and Mr. COOK paid special attention to the traffic organisation in that country, and were very much interested in the methods adopted to deal in a thorough and systematic way with all traffic problems, more especially in the districts served by the New York and New York & New Jersey Telephone Companies. These two companies have as traffic manager an officer of very great experience, assisted by a highly technical staff, and their experience has been that although this organisation is a costly one, it has not only justified itself in relation to its expense, but it has had an extraordinary effect in improving the quality of the service. As in New York so in the other places throughout the States the question has become a study, and practically everywhere the close and scientific handling of traffic is a living issue. Intelligent study of the method of handling calls and forwarding them to their destination with the least possible loss of time, and the consequent transmission of the largest amount of traffic over junction and trunk circuits is in itself fascinating; and the benefits both as regards the Company and the service to be derived from it make it one of the most important branches of modern telephony.

With a subject before it of such wide range and stimulating nature, it is anticipated that the forthcoming meeting will be one of exceptional interest, and that the resultant benefit to the service will be commensurate with its far-reaching importance.

GERMAN RATE REFORMS AND SOCIALISM.

THE question of the abolition of the flat rate in Germany and the substitution of a measured rate has now come before the Reichstag. The only modification of the original proposals (which we set out in our issue of February last year) which has resulted from the continuous protests and agitation of the large users is the decrease of the charge per call from 5 to 4 pfennige ($\frac{1}{10}d.$). The Secretary of State is convinced of the equity of the measured rate principle, and it is unlikely that the new tariffs will be materially altered. The principal opponent of the measured rate in the debate was Herr SINGER, the well-known Social Democratic deputy, and his chief objection to the reform was that the rural rates were to be lightened at the expense of the large towns; he complains that the Government is hopelessly at the bidding of the Agrarian party, and is purposely placing a burden on trade and industry. It is characteristic of the inexhaustible ironies of party politics that a socialist should appear as the champion of the large user of unlimited service, the man who gets more than his money-value out of the telephone at the expense of the small user; it i. characteristic, too, of party politics that the only underlying object of the proposed reform in Herr SINGER'S view should be the relief of the agrarian, when the Government professedly admit that they consider that subscriber who overworks his line—greatly to the detriment of his own and everyone else's service—pays far too little for it. In vain radical and conservative deputies point out that dwellers in small towns and in the rural districts are not wholly and solely agrarians, that the principle of payment per message benefit the small tradesman and other moderate telephone users, the socialist organ *Vorwärts* can only see in the new rates signs of "ossified bureaucratism and officialism," favourable alone to noble country squires.

To the practical telephone man the connection between socialism and cheap telephone rates has always been a little puzzling. Why the ratepayers of a town or the taxpayers at large should be burdened in order that a corporation should be enabled to supply business men and merchants with telephone service at rather under cost price is difficult to follow; we must confess that it seems to us rather a form of misguided protection than socialism. The case of Glasgow will at once occur to our readers, where the extremely small proportion of the population who benefited by cheap telephones did so at a loss which ultimately fell on the whole body of ratepayers.

TEAM WORK.

THE letter by Mr. W. DUFF STEWART in last month's JOURNAL, and that of Misses FITZGIBBON, SHORT and MANNING in this issue points to the existence of a phase of team work which though interesting is, we believe, quite wrong. It is an admitted fact that in some exchanges the "A" operators are regarded as being divided into so many divisions or teams, and the work of these divisions, particularly as regards the speed of answer, is compared one against the other. Mr. STEWART points out that the team is the whole exchange staff, and Misses FITZGIBBON, SHORT and MANNING argue against this view.

Let us consider the case of a football team. What would any players say if it were argued that the centre and the two wings should each compete among themselves as to the number of goals each division could obtain? Such a course would undoubtedly bring in a spirit of rivalry, and might lead to increased exertions, while it would in all probability not result in, say, the right wing refusing to pass to the centre. Yet no one could doubt its bad effect on the team's work as a whole, or that each division would have its judgment biassed in favour of its own men, and so give an unduly favourable leaning to the claim of its division.

In just the same way, team work in divisions, while probably not going so far as to be non-existent between divisions, will undoubtedly lead to less perfect results than if the whole staff works as one team. It is not that team work in divisions is bad, so much as that team work by the whole staff is better, and carries with it a far higher ideal and motive.

But there is another important side; are the figures on which the division's work is judged, reliable? We think not. Where these are taken from the observation results it is a pure assumption that because a call from a line arrives at a certain position, therefore the call is answered on that position. The choice has, in fact, to be made between saying (*a*) that this is an accurate assumption, in which case team work is not developed, or (*b*) that team work is developed, in which case the assumption is inaccurate. It is sometimes said that the number of calls about which there is a doubt is too small to destroy the value of the analysis, but this is not a tenable position. If we assume a division of nine positions, all equally loaded, and suppose team work limited to only two positions on each side of a signal, four positions in all (really a too limited application), then the calls regarding which doubt exists originate on four positions and equal 44 per cent. of the whole—a very serious amount to be in doubt.

The observation figures command respect because they are taken in such quantities and with such accuracy as to be fairly free from accidental variation, and therefore represent average figures with a considerable amount of truth. But these figures, though they may be accurate on the whole, will not bear subdivision and retain their accuracy. Before an average result for each division is assured there must be a large number of tests, and subdivision takes away this very accuracy.

The case is still worse when bad reports are taken up with a supervisor. A very few bad cases have been known to lead to enquiry, but there is absolutely no certainty that any one of these cases was handled by the division of the particular supervisor making the enquiry, and in any case this is a wrong use to make of observation records.

The enthusiasm and skill of the Company's operators is such that they have welcomed the advent of team work, and in this we think they are right. But we feel that anyone who carefully considers the matter in all its bearings will see that the practice of analysing the work of divisions is not only undesirable in itself but, unless special and wasteful methods are adopted, is so inaccurate as to be useless.

HIC ET UBIQUE.

THE *Telephone News* (Philadelphia) prints some verses wherein a black subscriber gratefully expresses her "Symphity for Central." The spirit is a willing one, but the feet are decidedly weak.

SYMPHITY FOR CENTRAL.

in atending to your Buisness
  is as good as one Could Wish
and in calling off numbers
  she very seldom Miss.
how could we speak so verry unkind
  to one who does your will,
to atend to duties of that kind
  takes patience pluck and skill.
    Miss
when you receive an unkind word
  don't wearry and regrett,
But just say to your self those parties
  have something to learn yet.

AN American paper, pointing a moral from the Guttenberg Exchange fire at Paris, remarks that in certain American towns where two telephone systems exist such a dislocation of business as arose in France could not possibly arise from the burning out of an exchange. This is surely one of the farthest fetched arguments ever brought forward in favour of telephonic competition. The economic waste of the establishment of two separate telephone systems—(to both of which the public must subscribe, for the opposition system would be of very little use to a non-subscriber in the case of a breakdown of his own system)—in order to provide a stand-by in case of fire seems to be an expensive form of insurance.

A CORRESPONDENT, who does not send his name as a guarantee of good faith, informs us that a gentleman who wrote to the head of a well-known electrical firm regarding the character and capabilities of a young lady typist recently in his employment, received the following reply:—

Re Miss Jones.

Dear Sir,—The irresistibility of this charming young lady approaches 20,000 ohms, and we were—solely on this account—sorry to part with her. Her output of work, if measured in terms of amperes, would put such a strain upon the decimal system of notation that we shall not attempt to give exact figures; we may say, however, that when shorthand writing from dictation the young lady averages about one "what!" per minute. As we are informed, her gravity—whether specific or otherwise—is in inverse ratio to the square of her distance from her employer.

If marriage is contemplated, we can strongly recommend the young lady; as a typist and shorthand writer she is—we desire to speak kindly—not a success.—We are, dear Sir, yours faithfully, ——.

NATIONAL TELEPHONE STAFF BENEVOLENT SOCIETY (LONDON).

DURING January fifteen grants were made, to the value of £53 8s., making the total number of grants to Jan. 31 145, amounting to £457 13s. 11*d.*

Total number of members at the end of January—2,703

On Jan. 20 the annual meeting was held, Mr. Roger J. Payne, the president of the society, being in the chair. There was only a small attendance of members, and the agenda were quickly disposed of.

During the month of February ten grants were made to the value of £23 1s. 6*d.*

Subscriptions received amounted to £11 10s.

COMPETITIVE PAPERS AT THE BRISTOL OPERATORS' SOCIETY.

THE concluding meeting of the Bristol Operators' Telephone Society on March 11 was devoted to the consideration of competitive papers written by 22 members of the exchange staff. The subjects dealt with included "Team Work," "Tact," "The Polite Operator," "Suggestions," etc , and the papers were all submitted under *noms de plume* and read out to the meeting by the Exchange Manager. Mr. A. Perkins expressed the pleasure which it gave him to act in the capacity of adjudicator, although the task was a difficult one, the papers all being good. The following were the winners :—

Seniors—
Miss M. Harvey, "Shamrock" .. .. .. First prize.
„ E. E. FitzGibbon, "Strong Supporter" .. Second „
Senior juniors—
Miss E. Gardner, "Experienced" .. .. .. First „
„ D. Davis, "An Operator" .. .. .. Second „
Juniors—
Miss I. Melrose, "Beta" .. .. First „
„ M. Russell, "An Amateur" .. .. .. Second „
Half-timer—
Miss O. K. Ferris, "Progress" .. .. .. —
Sub-exchange—
Miss M. Weston, "Cambridge" .. .. .. First „
„ L. Shelbourne, "S. E. O." .. .. .. Second „

Mr. R. A. Dalzell, the chairman and president of the society, presented the prizes, which included the works of Shakespeare, Tennyson, Wordsworth, Longfellow, Milton, and books of a lighter character by Rosa N. Carey, and others. Suitable quotations were given from each of the authors by Mr. Dalzell, who said that the high tone of the papers showed that the contributors had an intelligent grip of the work in which they were engaged.

Refreshments were served during an interval and much appreciated, and another item which was enjoyed by those present was an exhibition by Mr. Alfred Perkins of lantern slides of his own production, being views of various parts of the country taken chiefly during that gentleman's relaxation from business in the summer-time. Slides kindly lent by the Cunard Steamship Company showing views of *Mauretania* and *Lusitania* were also shown.

The following is a *resumé* of the principal papers read :—

TEAM WORK.

My opinion of this is very favourable indeed, owing to its beneficial effect, besides the improved and quicker service it gives to the subscriber. Through the combination of operators into teams we give better and quicker attention, as each member of the team naturally does her very best to head the list each month. This makes everyone feel that they are not only working to get praise themselves but are doing their best to benefit the subscribers and look to the interest of the Company. It throws more responsibility on the seniors as they have to watch their teams to find out all the weak points. Another advantage is that we all pull one way and by so doing we can make the work light. I think if the teams were all combined in one big team the interest, to a certain extent, would be gone, simply because we should have nothing to look forward to at the end of the month. I also think that all, from the senior to the junior, have benefited by team work.

MAY HARVEY (first prize), seniors.

"There's something in it indeed, there is *everything* in it." First I should like to say that I think it one of the most interesting things that has ever been introduced into our exchange, both for supervisor and operator. It has been the means of making great improvement in the service—one cannot fail to notice this.

The first thought that comes to one when put in charge of a team is "responsibility," and responsibility it is until everyone is in perfect working order. Understand your operators. When you wish to speak of irregularities avoid "nagging," or team work will *not* prove a success, for the girls will lose confidence in *you* and *you* will feel very much alone. At your post be masterly and be master, but not *masterful* or overbearing ; prompt others to their duty by devoted attention to one's own ; let the girls have *your* confidence, and in time all need of worry will pass away.

Again ; be cheerful—lend a helping hand to the team next to yours if necessary. Then, at the end of the month, what excitement ! who is top ? and may I add "Who is last ? " Enthusiasm begets enthusiasm, and if we should be last we *know* we did our best, and will try again to gain that longed for place, "top."

We could not do without "team work," and true lovers of it must bear me out in this bold statement. It is not sufficient to do what we can ; we must strive to improve our powers of doing, and of learning "there is no end."

EDITH E. FITZGIBBON (second prize), seniors.

TEAM WORK AND OPERATING FROM A SENIOR'S POINT OF VIEW.

The importance of a senior's duties, and the view she takes of them, have been greatly developed by the team work which is now working at the Bristol Exchange.

I should like to mention a few items from a senior's point of view.

(1) We should be firm whilst maintaining perfect good temper. I know patience is necessary with juniors when they are lax and not inclined to give their whole attention to the work they have before them ; we are anxious our team should come out top, but if bad temper or undue irritation is shown our influence will be lessened, because most juniors are very sharp to pick faults in their seniors.

(2) We must concentrate all our attention on the work, and then we shall be always ready for any difficulty that may arise through the day.

(3) We must maintain the spirit of healthy rivalry between the teams, not "working" in divisions ; but keeping the true *esprit de corps*, which enables us when the monthly record is read out to cheer the winner with perfect sincerity, knowing each one *has done her best*.

FLORENCE MANNING.

To obtain a good service, team work should always be introduced. It is undoubtedly a splendid system for encouraging operators in their daily duties, and tends to develop a friendly rivalry between the operation of the various teams, whereby the work is far more satisfactory to all. The operator who is prone to be idle rallies, and throws off dull sloth in the endeavour to become a member of the "first team."

Personally speaking I think it introduces a pleasant stimulus into what would be a rather monotonus and tedious work, and those centres where this system is not practised I would strongly advise to adopt it at once.

EDITH BROMFIELD.

Team work, I am sure, is a great benefit to every operator, for she realises how much is dependent on her individual work in the team, consequently she makes every effort to connect correctly and rapidly, thus becoming a good and careful operator. It also encourages her to do her best in order that her team may be top, for no one wishes to be bottom every time, and I am sure working in co-operation is far better than working for oneself.

The senior, too, is a great help to her team, for she is able to correct any of the operators should they use a wrong expression, or take out their cords carelessly, faults which, if not corrected, would eventually become a habit.

Although I did not become an operator before team work came into vogue, from what I have been able to gather, working in a team is certainly more likely to make our our service more efficient. IVY MELROSE (first prize), juniors.

The method of team working is a most interesting and encouraging arrangement, as each operator is obliged to help with her team, and at the end of each month is very anxious to know how it is placed on the list. Needless to say the top team are considered the "smartest" operators until the end of another month, when, of course, a fresh list is made. DOROTHEA HAZELL.

In this system every operator seems to be better looked after in many ways than perhaps they otherwise would be, as in every case the senior operator takes a special interest in her own particular team. Therefore the juniors look up to her and place before her their grievances respecting matters they might otherwise treat as paltry ; and as in so many cases it is the little things that count, this works out very well. DOROTHY CROSS.

SCATTERED THOUGHTS AND SUGGESTIONS.

Intending new subscribers are, I believe, given to understand that the service they will receive will be the best and most efficient that can be obtained, and, personally, I think much depends on the operator for the fulfilment of this promise.

It is a great boon if an operator can gain the confidence of her subscribers. This can be greatly helped by giving correct numbers, answering politely and cheerfully, getting all calls effected if possible and reporting all faults as soon as they are noticed, also if she can prevent a rise in that temper which by experience an operator knows lies dormant in nearly all telephone users.

DOROTHY DAVIS (second prize), senior juniors.

THE POLITE OPERATOR.

"A soft answer turneth away wrath but grievous words stir up anger." Surely this is the text for the telephone operator whose patience is often sorely tried by irate subscribers. To give a sharp answer does not help her in the least, but only further irritates the subscriber who is probably a business man with financial worries and finds the telephone a convenient outlet for his wrath. Then there is that incorrigible "office boy," whose sole object in life seems to be to torment anyone he can get at, his victim being too often the telephone operator. Here again, however, any contention on the part of the operator only serves to gratify the boy's spirit of mischief. It is always best to give a polite answer and then, if the annoyance is continued, to leave the matter to be dealt with by the exchange manager or clerk-in-charge. EMILY SHORT.

WHY I THINK IT BEST TO ABOLISH "SHALL I CALL YOU?"

(1) It would save time to the operator.
(2) It would make more effective calls.

Let me try to explain why ! We answer in the ordinary way "Number, please," subscriber calls for, say, "429" ; operator says "Number engaged, shall I call you ?" Subscriber is a busy man and probably trying to do two things at once and wishes question repeated, "Shall I call you ? Oh, never mind, I will call again" he says. Well, my opinion is that that call is practically lost, for the subscriber is such a busy man that he will not bother to ring again. Again, the operator while she is asking the question and waiting for an answer, could connect another subscriber.

MAY HARVEY (first prize), seniors.

"Shall I call you" should be abolished, as it is asking the subscriber a question to which naturally some sort of answer is returned. Thus a little unnecessary delay occurs through the operator having to wait for this answer.

The best expression and one that has been suggested is "I'll call you." This is a statement that would be fully appreciated by a measured rate subscriber, and involves no delay in waiting for an answer.

DOROTHY DAVIS (second prize), senior juniors.

I think "I'll call you" is the best for the following reasons :—

(1) It is quicker than "Shall I call you ?" and there is no need for the operator to wait for a reply.

(2) It sounds better and as though the operator really *wished to oblige*.

GLADYS HAMILTON.

TACT.

One of the most essential traits in the character of a good operator is "tact." Just the knack of doing the right thing at the right moment. The wheels of the exchange do not always run smoothly, and it is just at the moment when things look a little black that "tact" comes in.

Perchance a subscriber has called a number and at a critical moment in the conversation he is cut off. It may, or may not, be the fault of the operator, but the subscriber certainly feels angry. Things are not at all to his liking and rightly so, therefore when the operator endeavours to find out his trouble she has a little of his mind, but if she is tactful a few explanatory words spoken in a regretful tone of voice will assure him that the mishap was not intentional, and his anger is appeased and confidence renewed. It may not always be the lack (as he supposes) of attention at the exchange. Everyone has a temper, and if our subscriber goes to the telephone in a very unsettled frame of mind and everything is not exactly plain sailing someone has to suffer, and why not the operator? He may say things not exactly truthful, and I am sure the operator must resent such, but she exercises a little thought and tact, and instead of a hasty retort, uttered in a very unmusical tone of voice, she speaks in a pleasing soft tone ("an excellent thing in women") which, instead of jarring on, must soothe the jangled nerves at the other end of the wire. In many ways too numerous to mention the tactful operator can remedy a fault where one without tact would make things much worse.

Also between operators themselves "tact" is very necessary. A junior operator does not know so much of the telephone life as a senior, and so may sometimes make mistakes. Of course it is the senior's place to correct her, and if tact is used this may be done in a nice way, but if the senior is not tactful, and the junior a little sensitive, how often hurt feelings are the result!

I think supervisors are always wanting to exercise tact in business, and if the operator cultivates this quality when a junior, how much better she will be able to fulfil a higher position when the time comes for her to take it.

ENID GARDNER (first prize), senior juniors.

SUB-EXCHANGE WORK AS WE HAVE FOUND IT.

My experience of sub-exchange life has been pleasant, and I have made it a rule to study my subscribers, find out what kind of tempers they have, how I must treat them, and if they are somewhat impatient, by a little coaxing try and win their confidence. In most cases it rests chiefly with the operator in the training of her subscribers as to how they treat her in return, as an instance of this I remember a certain subscriber who, when first connected, really frightened me. I had only to ask him if he had finished; that was enough; I had to put him straight through to the exchange manager; each time I dared to challenge his line he would jump at me, but when, after a few months, he saw that I tried my best in every way for him I never had any more trouble, he would always answer when I rang, and never forget to ring off.

With reference to party line working I think the expression "line engaged" gave more satisfaction than "number engaged." Many of my subscribers have asked me to explain why it is that certain numbers have not been able to get through to them, and have been told "number engaged" when they had not been engaged, and the only reaso. I have been able to suggest is that their partners had been using the line.

MABEL G. WESTON (first prize), sub-exchange operators.

Although team work is not possible at a sub-exchange I think it quite possible for competition between the exchanges to be equally keen as between the different teams at Bristol. I do not like to know, or think, that other sub-exchange operators answer more promptly, or are in any way giving a better service than myself, though no doubt many are. Speed may not be so essential to a sub-exchange operator, but on the whole I think we have greater responsibility. We are able to take a great deal of interest in our subscribers, I do not mean to say that Bristol operators cannot do so, but we, answering the same subscribers every day, and having more time, are able to study them more closely, and some of them are very interesting studies.

Careful supervision of junction lines is necessary, as subscribers frequently forget to ring off, and if our lines are not promptly cleared it of course causes delay.

I should like also to say how splendid I think our monthly meetings are. We have always such interesting papers that I look forward with pleasure to each meeting. I have been impressed chiefly with one thing, which is that, although we may only be junior or half-time operators, our services are just as indispensable as those of a senior operator or supervisor.

LUCY SHELBOURNE (second prize), sub exchange operators.

TELEPHONE INSPECTOR AS DETECTIVE.

ON Dec. 19 John Randall Manning, an inspector employed on the Norwich staff, materially assisted in bringing to justice two burglars. A subscriber, Mr. Edward Coe, of Whitethorn Lodge, Norwich, had just vacated his residence and given instructions for the removal of the telephone. When the inspector went to carry out the work he was unable to enter by the door, of which he had obtained the key. He managed, however, to enter the premises through an unfastened window. His suspicions were further aroused by a barrow standing outside the house and two faces at one of the upstair windows as he left the premises. He at once advised the police and returned to the house, where two men were found secreted in a cellar cupboard. They had been robbing the house of gas fittings and other articles. Manning was complimented by the police and magistrates for his assistance.

DISTRIBUTING STANDARD, LEICESTER.

BY LEONARD PRICE, *Local Manager.*

THE following short description of a distributing standard recently erected in Leicester may be of interest to readers of the JOURNAL:—

Owing to wayleave difficulties in the Charles Street area and the congested nature of the buildings, it became necessary to adopt other means than ordinary distribution from a ground pole.

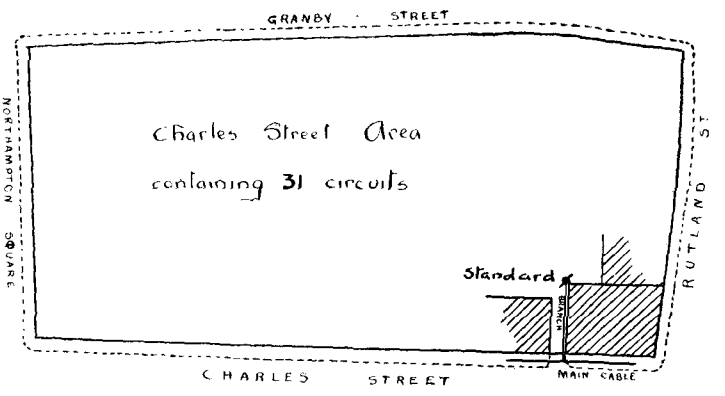

FIG. 1.

The only building suitable for a standard is a factory standing at the corner of the area. This factory, however, is 75 feet high, and it was quite unnecessary to place a standard on the top for the purpose of getting clearance, while the heterogeneous nature of the buildings in the area rendered covered distribution impracticable.

The building referred to above is a very substantial one, and

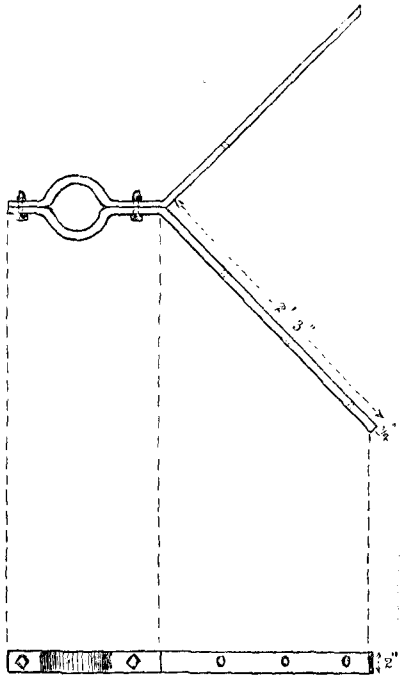

FIG. 2.

the idea of fixing an erection on the corner suggested itself. This appears at first sight to restrict the distribution of open wires, but a glance at Fig. 1 will show the position of the area.

It will be seen that all parts of the area are accessible, whilst terminating in the factory itself is a small cable supplying a private branch exchange.

The standard is an ordinary 4-inch steel pole cut down to 10 feet 6 inches in length, as the whole of it can be utilised for arming if necessary. It is supported by three wrought-iron brackets, made locally. These are formed in two parts, as shown in Fig. 2.

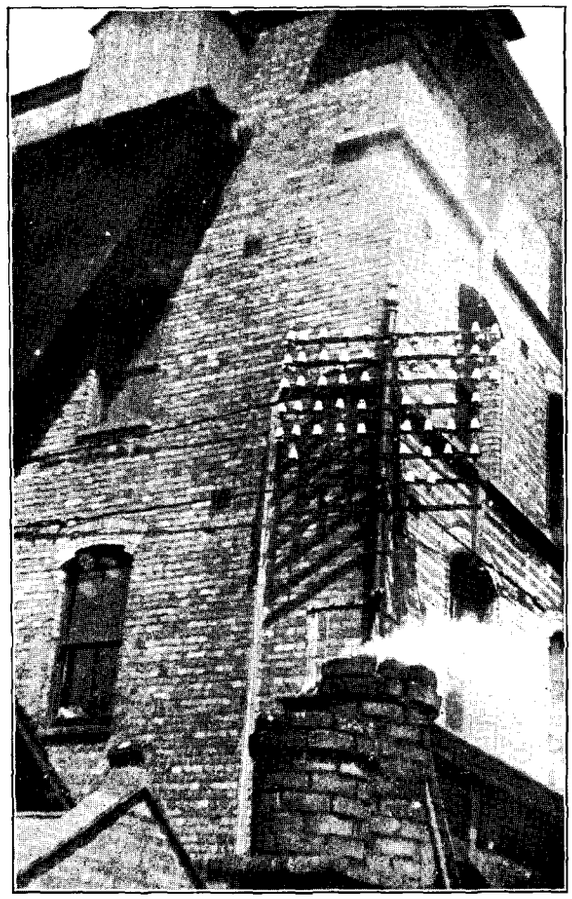

FIG. 3

They consist of 2 inches by $\frac{1}{2}$ inch iron clamped together, one on each side the tube, by $\frac{5}{8}$-inch bolts. They are fixed to the brickwork on on each side by two 6-inch spikes and a 23-inch by $\frac{5}{8}$-inch bolt, the latter passing through the brickwork (which is 21 inches thick and secured by a plate on the inside.

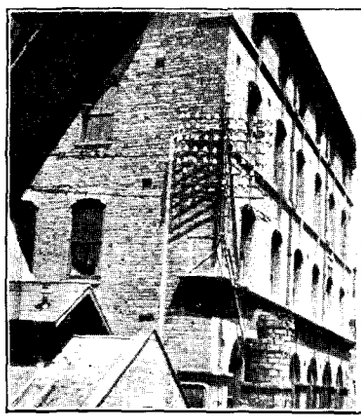

FIG. 4.

FIG. 5.

A strut of similar dimensions to the bracket is fixed under the bottom bracket as an additional support for the vertical pressure, as shown in Fig. 5. In order to distribute the strain due to tension of the wires over a larger area of the brickwork the pole is stayed by means of four wall plates and swivels, as shown in Figs. 3 and 4. These are screwed up as tightly as possible, and add considerably to the rigidity of the structure.

The 50-pair dry-core cable is clipped to a board fixed on the wall, as shown on the left-hand side of standard (see Fig. 3). Fig. 6 shows the work in progress.

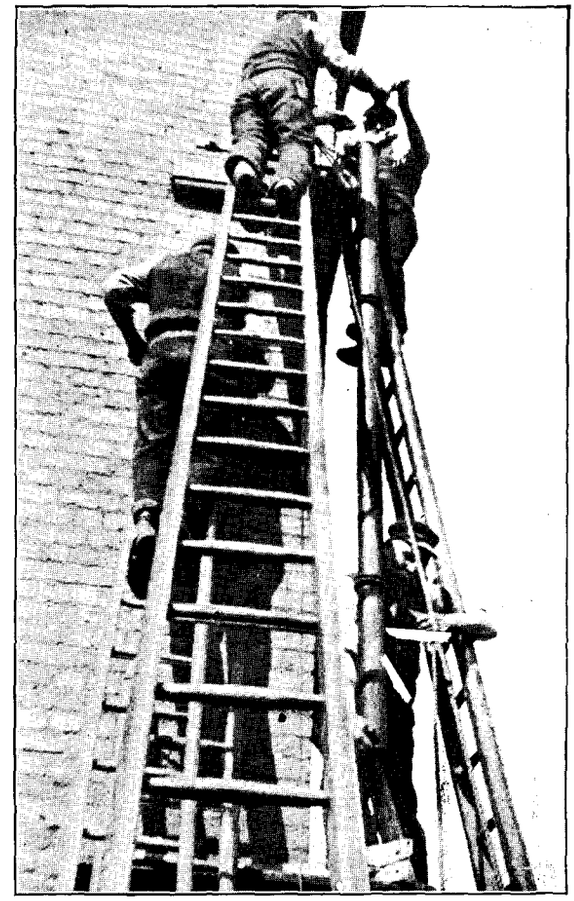

FIG. 6.

The photographs, which were rather difficult to obtain, were taken by Engineering-Inspector Garrard.

UNDERGROUND AND OVERHEAD IN 1843.

THE following reprint from an old magazine of July, 1843, the *Practical Mechanic*, is of interest as showing the reverse of the practice which is going on at present, in that it describes the transfer of telegraph wires from underground to overhead. The details of the construction practice of those days and the figures of cost will be found of interest :—

Formerly, the telegraph wires were always laid in iron tubing. These wires were of copper covered with cotton, and carefully varnished. The tube after being carefully tarred, was either laid in the ground or fixed on low posts and covered with a wooden rail. This plan has been perfectly successful, and will no doubt continue to be applied in situations where the wires would be liable to injury if left exposed. It is that employed on the Blackwall, the Leeds and Manchester, and the Edinburgh and Glasgow Railways; and it was the plan first adopted on the Great Western Railway. But it is liable to two objections—it is at first costly and difficult to repair when injured. The difficulty of repair, indeed, consists chiefly in finding out the point of injury, and has been much lessened by the invention, by Mr. Cooke, of an instrument which he has named the detector, its use being to detect the point of interruption of the voltaic current, either by contact of the wires with the pipe or with each other, or by fracture, or the presence of water.

Fig. 1 shows the instrument and the mode of applying it. D is the detector, B a small battery, and *f*, *f*^{1} are *feelers* in connection, the one with the detector and the other with the battery. Whenever these feelers touch each other an electric current passes from the battery and influences the index of the detector D, which it will be observed is simply a galvanometer constructed precisely in

the same way as the elementary telegraph. *c* is one of the iron boxes (with its lid removed) which occur at short intervals along the line of tubing, for the purpose of allowing access to the wires in cases of derangement of the telegraph. These boxes also serve to connect the lengths of wire along the line; the terminations of the set of wires are introduced into the box, and each wire is screwed with its fellow to a piece of wood fitted in the bottom of the box, so that the wire marked 1 is continuous throughout the whole length of line, and being always connected by the screw 1, is recognised in every box.

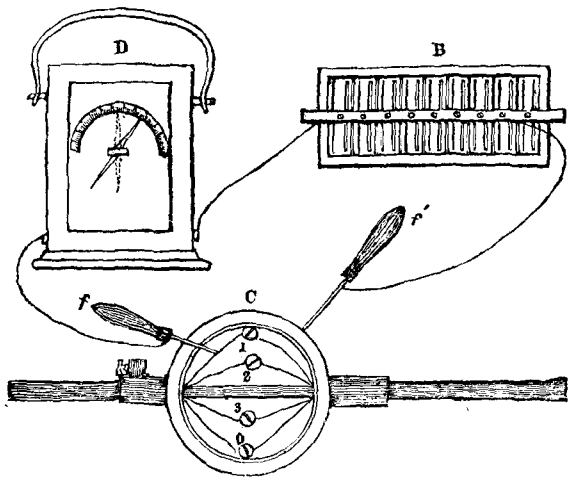

FIG. 1.

The openings by which the wires enter the box are securely closed with composition; but a small tube passing through the box admits a free communication of air from a distant reservoir. Supposing a derangement takes place and that the current does not pass from one station to another on account of the wires, 1, for instance, coming into partial contact with the tube, either by the metals touching or the presence of water. Upon opening the box at which the wire is to be proved the screw 1 is taken out, and the feeler *f* brought into contact with one end of the separated wire, the other feeler being kept in contact with the pipe. If this portion of the conducting wire be sound, the needle of the detector remains stationary; but upon moving the feeler *f* to the other liberated end of the wire, the detector index moves on its axis, and indicates on the graduated scale the degree of contact existing between that portion of the wire and the tube. Supposing the same experiment to be tried at the next box, and the contact proved to lie between the two boxes, the intervening faulty portion of wire is exchanged for the sound wire marked 0—which is a spare wire introduced for such repairs; by this means the wire 1 is restored to soundness. The minutest changes in the insulation of the wires from dampness can be detected by this valuable instrument, and corrected by blowing through the pipe a draught of dry air from the reservoir.

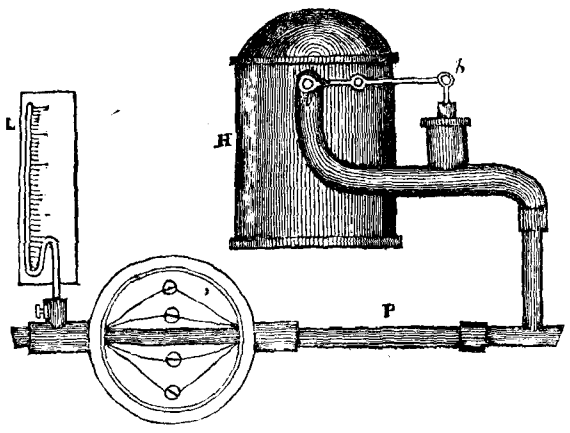

FIG. 2.

The apparatus for accomplishing this object is shown in Fig. 2. H is the air reservoir, charged with dry air to any required pressure. *h* is a pressure balance, in the form of a lever; *v*, a valve communicating, by a minute opening, between the reservoir H and the pipe P. The balance *h* is loaded to the pressure required—say, 3 lbs., that being calculated as sufficient to exclude the greatest pressure of water to which the pipes are liable. On any escape of air taking place from the tube, the lever-arm *h* would descend and open the valve *v*, till the high-pressure reservoir had restored the pressure in the tube; the lever-arm would then rise, and shut the valve *v*. A barometer, L, may be applied to indicate the pressure, either in the tube or reservoir.

These appliances are, however, rendered less important in consequence of the plan now adopted of suspending the conducting-wires on poles in the open air, and which will doubtlessly supersede the plan of laying the wires in tubing, in every situation where it can be applied. A general representation of it, as laid down upon the Windsor line, which Mr. Cooke has just completed, is given in Fig. 3; for which, with the description following, we are indebted to Mr. Wishaw's paper, read at the meeting of the Society of Arts of the 17th May.

The plan consists in firmly fixing into the ground, at every 500 or 600 yards, strong posts of timber, from 12 to 18 feet in height. On the tops of these posts is a series of winding apparatus, corresponding to the number of conducting-wires to be employed; and between every two such posts, upright wooden standards are fixed, from 60 to 70 yards apart. A ring of iron wire (No. 7 or 8) which has been formed by welding the short lengths in which it is made together, is then placed upon a reel carried on a hand-barrow, and one end being attached to the winder at one draw-post, the wire is extended to the adjoining draw-post, and there fixed to its corresponding winder; by turning the pin of the ratchet-wheel with a proper key, the wire is tightened to the necessary degree; thus the greatest accuracy may be attained in drawing the wires up till they hang perfectly parallel with each other. To sufficiently insulate the wires so suspended at the point of contact with the posts is an object of indispensable importance, as the dampness of the wood during rainy weather would otherwise allow the electric fluid to pass off freely into the earth or into an adjoining wire, and thus complete the circuit without reaching the distant terminus at which the telegraphic effect is to be produced. In this, indeed, lies an important feature of Mr. Cooke's invention, as the mere idea of supporting wires in the open air from poles, trees, or church steeples, is the oldest on record. To effect this object, at the draw-posts wooden boxes are employed to enclose that portion of the post to which the winders are attached, and small openings are left for the free passage of the wires, without risking any contact with the outer box. The standards are furnished either with covers parted off by an overhanging roof between each wire, and again between the lowest wire and the earth, or by a series of metal shields. An eye of metal, with a slit on the upper side, forms a hook to support the wire, which has a split quill slipped over it at the point of support, to insulate the wire from the hook, which might otherwise act as a

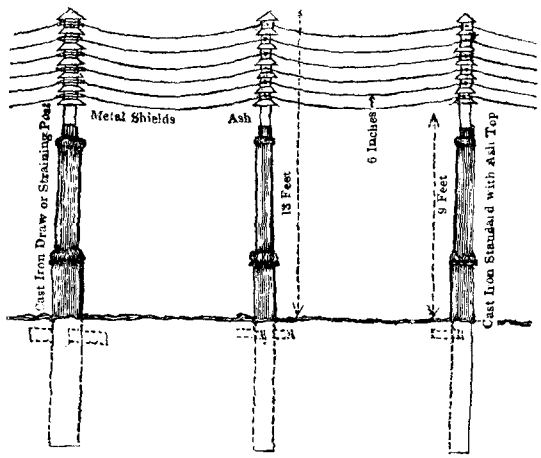

FIG. 3.

conductor to the dampness in the wood. The whole is then carefully painted with several coats of anti-corrosion paint—or asphalte varnish may be employed for the wires. When the wires are to be varnished, they are unhooked from the upper ends of the standards, and lowered to nails temporarily fixed to receive them toward the bottom of the posts. A painter, furnished with a can of paint hung on his shoulder, a brush, and a piece of felt, takes each wire and rapidly coats it, when it is again hooked up in its position at the top of the standard. This is the simplest and cheapest method now adopted. But for long distances Mr. Cooke employs earthenware or glass for his insulation, and cast-iron standards and posts, with ash tops, for drawing and suspending the conductors, which instead of single wires, will be strands of six or more wires twisted together. For very great distances, when very superior conducting power will be needed, a copper wire will be placed in the centre of the strand, and whilst it adds but little to the weight, it will more than double the conducting power thereof, the iron wire still giving the necessary strength to resist tension. The relative conductive powers of copper and the softest iron wire are nearly as seven to one. Various methods are adopted in passing under bridges, which answer the purpose of draw-posts, the winders being fixed to a piece of wood partly let into the brickwork, to avoid damp (the greatest enemy to electric conduction); earthenware insulators are also introduced between the winder and wire. Mr. Cooke also intends to use caps or boxes of earthenware to surmount the iron standards.

"At Slough, for half a mile in approaching and passing by the station, cast-iron standards and draw-posts are employed, the effect of which is remarkably light and elegant. A line of six wires is there completed: and in crossing over a carriage shed immediately opposite to the station, the wires are stretched over a length of 438 feet without any intermediate support; and so accurately are

they arranged, that no difference is perceivable in their parallelism. The draw-posts in this instance are half a mile apart, although the line is slightly curved. In passing over a station or an accommodation-road, or in crossing the railway, loftier standards are employed, which abruptly lift the wires to the height of 25 or 30 feet, in order to clear objects passing below. In the latter case lighter wires are employed, that the tension out of the direct line of strain may not draw the standard from the perpendicular.

"The ordinary precaution of charring, pitching, and kyanizing the posts is carefully attended to; but in case of the decay of a standard near the earth, then it is only necessary to provide a new piece for the bottom, to which the upper portion can be spliced. The method of letting the standards into the earth is novel and convenient. For this purpose Mr. Cooke employs a boring tool accurately agreeing in size with the iron standards, and rather larger for the wooden ones. The level, taken from the rails, gives the depth to which the standards are to be sunk, which is chalked on the boring tool, and in the course of a few minutes, where the soil is suitable, the hole is opened and the standard fixed and rammed closely round the sides without the soil being disturbed.

"An admirable point in this system is its adaptation to cases where a telegraph is only occasionally required, as in the repairs of railways, when one line is temporarily closed on the falling of a bridge or slipping of an embankment, as occurred on the Croydon line. The materials being kept ready in store, are conveyed to the spot, the holes bored for the posts, the wire strand run out, and a telegraph is working in a few hours. Upon the necessity ceasing, the strands are again wound up, the posts lifted and sent again into store, in readinesss for the next emergency."

One obvious advantage which this plan has over the old one of laying the wires in tubing is the facility of repair which it allows; and in point of first cost it has likewise a decided advantage. The cost of the original plan with tubing stands nearly as follows:—

Prepared ¾ tube, varnished within and without, 5½*d.* per foot	£115	10	0
Six copper wires, covered and varnished, at £6 15*s.* per mile	40	10	0
Labour and carriage, per mile	27	0	0
Iron fittings, boxes, etc.	12	6	0
Tar, pitch, paint, rosin and sundries	15	0	0
Post and rails, at 3½*d.* per foot, including fixing ..	77	0	0
Making the total cost per mile	£287	6	0

To this a percentage for casualties, profit to the contractor, and the price of instruments, remain to be added.

The present plan of suspension may be estimated thus:—

Six iron wire strands or ropes	£48	0	0
Drawing posts, with winding apparatus, and cast-iron standards with insulators	52	0	0
Labour in fixing and painting, per mile	12	6	0
Anti-corrosion paint and tar, per mile	11	0	0
Carriage, tools and sundries, per mile	13	0	0
Contingencies, per mile	13	0	0
Total, per mile	£149	6	0

making a reduction of about 50 per cent. in favour of the present plan, and a still greater advantage in favour of the permanency of the work.

CORRESPONDENCE.

EXCHANGE NOMENCLATURE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

DEALING with the question of the naming of exchanges, the instructions are that in *every* call the name of the exchange has to precede the number; but may I ask if this is essential in the case of a subscriber calling for another on the same exchange? If the number only is given it may be properly supposed that a subscriber on the local exchange is required.

Further than this, could not exchanges with cumbersome titles be briefly re-christened by the Company? Since the instructions have been enforced here one or two subscribers have decined to ask for, say, "Cheltenham 900," but use the abbreviated "Chelt. 900"; and as this name is not likely to clash with that of any other exchange, I would suggest its official adoption.

This idea might be extended, Westbury-on-Severn being christened "Severn" (to avoid confusion with Westbury-on-Trym); Wotton-under-Edge, "Wotton"; and so on. It has its limits, however. Cinderford could not be termed "Cinders" without a protest from the libelled subscribers.

Sufficient evidence will, I think, be obtained in reply to Mr. Valentine's letter and your editorial to prove that the Company has a few hundred exchanges which might be with advantage overhauled and re-labelled.

Cheltenham, March 10. W. A. TAYLOR.

ROTTERDAM EXCHANGE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I NOTE that in Mr. France's article upon the Rotterdam Exchange, page 206, eighth line, he speaks of the "hand micro-telephone set." It would be interesting to have some particulars of this transmitter, as we have always been given to understand that no hand micro-telephone, so far produced, would give satisfactory results with the currents used in common battery working.

Hull, March 9. W. A. ALLISON.

[The hand micro-telephone sets in use at Rotterdam are of Messrs. Ericsson's manufacture and are designed for common battery working. The main difference between these and the usual local battery type is that a different make of granular carbon is used and the circular receptacle in which this is placed is divided radially into six separate compartments.

There is no difficulty in getting a hand micro-telephone set to work on a common battery system and there are several different makes at present on the market. The only reason they are not being used by the Company with the common battery system is simply one of cost, as with a hand micro-telephone set there is a considerable loss in the transmission with the average speaker, due to the distance the mouth is away from the transmitter. To overcome this loss it would be necessary to build our lines with heavier conductors, which, of course, would considerably increase both our capital and annual charges. Further, the maintenance charges on the hand micro-telephone set would be heavier than on fixed transmitters.—*Ed.*, "N. T. J."]

TEAM WORKING.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

REPLYING to Mr. W. Duff Stewart's letter in the March JOURNAL, *re* the above, we, the undersigned, on behalf of the Bristol operators, would like to point out that he is in error in presuming that competitive team work, means work in divisions, or dead ends between teams in the exchange, or that there is any antagonism between the teams.

The statement that with competitive team work there must be divisions or dead ends (or ends of teams), where an operator would not when necessary assist her neighbour must be based upon imagination, for it does not exist *in fact*. The very principle of team work, as we understand it, is "Each for all," and we recognise that if we refuse to help another operator because we happen to be in another team, such action would recoil on our own heads, for when *we* were busy our neighbour, on the same principle, would not assist us, and the same argument would apply to individual operators.

We all work for the common good, but we have amongst us a spirit of healthy rivalry that has raised our service to one of the *top places where we intend to remain, or get higher still.*

If the system was changed to a continuous line as suggested, we cannot see that we have anything to gain, but we stand to *lose* a great deal, it would have a bad effect on our present good working and would also have a tendency to destroy the interest of our operators, and create 24 dead ends, as against the present four imaginary ones.

E. E. FITZGIBBON,
E. E. SHORT,
F. MANNING,
} Senior Operators and Captains of Teams.

THE VALUE OF UNSUCCESSFUL INTERVIEW CARDS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

MR. COOPER has clearly opened up a subject of lively interest to contract men. Let us then try and get something definite out of it. The unsuccessful interview cards "to be or not to be, that is the question." No good purpose will be served by harking back to the theory of the card system. It may be taken for granted that Mr. Cooper has the theory off by heart, else had he not made a special study of the subject. He certainly has the courage to lay open his actual experience to the onslaught of prospective critics.

What are the practical advantages and disadvantages proved by experience? Let us state frankly our experiences. Mine are as follows:—

For.—The cards are valuable as

A plank in the organisation.

A proof of work done.

A real asset in the name and address of possible subscribers on whom the contract manager can direct fresh energies, whether by mail or canvasser.

Pegs on which contract officers must hang their claims to the credit of orders.

Records on which our returns are compiled.

Against.—Clerical labour increased.

Accumulation. In a big district the cards accumulate to such an extent that frequent clearings out are necessary, and this work seems sheer waste. (There's room for a little philosophy here.)

They are often declared by succeeding canvassers to be valueless and in fact misleading.

They are beloved by the shirkers, but not by the workers. The former are enabled to adduce much evidence of their activities, whereas the latter are concerned only in getting orders and have no use for reports. HENRY ELLIOTT, Contract Manager.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I HAVE read with much interest the letters on this subject from Messrs. Maclure, Nicholls and "Northern Province," but I think it would be better that I should delay replying in full to them, as it is probable other contract managers may have written on the subject.

I would therefore prefer to reply later to all the points which may be raised.

Bristol, March 20. E. SEYMOUR COOPER, Contract Manager.

[*Drawn by* E. J. CLARKE, *Brighton*

THE FLAT RATE TELEPHONE?

Smith *(to Jones, who has recently had telephone installed)*: What's the matter, old man, a riot?
Jones: Riot, no. Simply a few friends using my telephone.

CORRESPONDENCE CLASSES.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I HOPE that Mr. Hague's letter will be the means of remedying the way in which the Correspondence Class answer papers are marked.

From my own experience I have come to the conclusion that the classes are run with too small a staff and that the answer papers have to be dealt with too hurriedly to allow the necessary amount of judgment to be used when marking them.

A report is issued on the various classes at the end of the session which gives the number of students who have not sent in a full set of answer papers. I think that this is partly due to the way in which some of the questions are set. Often some little detail is omitted, which perhaps does not suggest itself to the student, with the result that after many hours spent in trying to cope with the question it is given up. As the session goes on he comes across two or three such questions and these coupled with unsatisfactory acknowledgments of his previous efforts, so discourage him that he gives up answering the questions and probably the remainder of the text books are left untouched.

As the answering of the questions is a great impetus to the student to read his text books carefully I think that increased care should be taken in correcting the answers and in making the questions straightforward and complete.

Liverpool, March 16. W. BRASSINGTON.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL

WITH reference to Mr. Hague's letter in your last issue as to alleged incorrect marking, there appears to be some discrepancy which the committee would like to look into, and if the two papers in question are returned to the Engineer-in-Chief's office (Reference 52) the matter shall be investigated.

P. H. C. PRENTICE
(for the Committee, Correspondence Classes).

NEWS OF THE STAFF.

Mr. A. C. GODFREY, Chief Clerk, Liverpool, has been appointed Chief Clerk, Manchester. He entered the service of the Western Counties & South Wales Telephone Company at Newport, Mon, on Jan. 3, 1888, being transferred to Bristol in Jan. 1891, and has passed successfully through the following grades:—Night Operator, Storekeeper, Batteryman, Instrument Fitter, Inspector and Stores Clerk. In December, 1899, he was promoted to be Chief Clerk at Hull, and was appointed Chief Clerk at Liverpool in October, 1905.

Mr. R. J. WELSH has been promoted from Junior Stores Clerk at Liverpool to be Chief Stores Clerk at Manchester. Mr. Welsh entered the Company's service in June, 1903, as Correspondence Clerk at Liverpool, and was promoted to be Junior Stores Clerk in June, 1905.

Mr. A. W. G. HEWITT has been transferred from the Rental Department, Liverpool, to be Rental Clerk, Manchester. Mr. Hewitt entered the Company's service in June, 1905, as Correspondence Clerk, and was transferred to the Liverpool Rental Department in December, 1907.

Mr. WM. LEE, Chief Clerk, Oldham, has been appointed Chief Clerk at Liverpool. Mr. Lee joined the Company's service in 1890 at Barrow-in-Furness. He was transferred to Whitehaven for a brief period, and thence as Stores Clerk to Blackburn, in which office he passed through the various grades to Chief Clerk in five years. Mr. Lee was transferred to Oldham as Chief Clerk in September, 1904.

Mr. J. W. FAIRHEAD, Chief Clerk, East Coast district, has been appointed Chief Clerk of the Oldham district. He entered the service in October, 1899, and was appointed Chief Clerk at Norwich in 1903. Mr. O. W. Stevens, District Manager, on behalf of the staff of the East Coast district, presented him with a watch, and expressed the good feeling and kind wishes of the entire staff; he was followed by Mr. W. J. Pratt, Cost Clerk, and Mr. H. H. Wigg, Local Manager. In acknowledging the gift, Mr. Fairhead expressed his regret at leaving the district, and trusted that he would find the conditions as satisfactory, and fellow-workers as amiable in his new sphere.

Mr. T. J. CLARK, Chief Clerk at Manchester, has taken over the duties of Chief Clerk for the Norwich district.

W. S. MCKIE.

Mr. F. G. A. KIFF, Chief of the Shares Department (Secretary's Office), has completed 25 years' service. He entered the Mincing Lane Exchange of the United Telephone Company on March 4, 1884, and has been successively a Clerk under Mr. Anns, Clerk in the Rentals Department and in the Shares Department.

Chief Inspector W. S. MCKIE, of the Glasgow District, completed 25 years' service with the Company on March 10. Mr. McKie joined the telegraph staff of the G. & S.W. Railway Company in December, 1877, and served under the telegraph superintendent, Mr. James Reid, until March, 1884, when he became one of the comparatively small band then forming the Glasgow staff of the National Telephone Company, Limited.

Another member of the Glasgow staff, Mr. THOMAS DONALDSON, Chief Mechanic, also celebrated his semi-jubilee recently, he having joined the service on Jan. 10, 1884. Their fellow-employees join in offering both gentlemen their hearty congratulations and best wishes.

Miss AMY ELLERY, Supervisor, Docks Exchange, Swansea, has been appointed Clerk-in-Charge, Swansea Central Exchange.

Miss ROSE SMALE, Senior Operator, Swansea Central Exchange, has been promoted to be Supervisor.

Miss MILDRED OWEN, Senior Operator, Swansea Central Exchange, has been appointed Observation Clerk.

Mr. H. C. G. BUFTON, who has been in the Company's employ for about two years at Folkestone, has left the service to emigrate to Canada.

Miss E. COOPER, who has just resigned her position as Operator at Eastbourne, was presented on March 9 with a dressing case and purse by the members of the Eastbourne staff, after over four years' service. The presentation was made with an expression of good wishes to go with her in her future career.

Mr. ROBT. P. CRUM, Exchange Manager, Royal Exchange, Glasgow, has been transferred as Exchange Manager to Hillhead New Exchange.

Mr. CHAS. N. CARTER, Traffic Superintendent's Office, Glasgow, has been appointed Exchange Manager, Royal Exchange.

Mr. WM. A. FRAME, Observation Officer, Glasgow District, has been transferred to the Traffic Superintendent's Office as Exchange Manager under training.

Mr. JOHN PATON, Night Operator, Govan Exchange, has been appointed Observation Officer, Glasgow district.

Mr. A. C. MORRIS has been appointed Electrician and Traffic Manager, Nottingham. Before leaving Wolverhampton he was presented with a pipe, the presentation being made by the District Manager, Mr. Archer W. Smith.

Mr. FRANK C. FRENCH, of the Statistical Office, London, has been transferred to Manchester as Cost Clerk. He entered the service at Canterbury, in the East Kent district, on March 4, 1897. On March 12 upon his transfer as above, he was presented with a diamond pin by a few of his colleagues.

Mr. H. R. MOULTON, Chief Clerk, North-East Divisional Engineers' Office, has been transferred to the Statistical Office *vice* Mr. F. C. French.

London Traffic Department.—*Promotions and Transfers:*

Miss ETHEL GILDING, Operator, Gerrard, has been promoted to be Supervisor at Westminster.

Miss ALICE MINNS, Operator, Avenue, has been promoted to be Monitor, Tottenham.

Miss LILIAN BAILEY, Supervisor, Westminster, has been transferred as Supervisor to the Operating School.

Miss EVA SHERBURN, Supervisor, Holborn, has been transferred to Avenue Exchange.

Miss ELLA MCLEOD, Operater, Westminster, has resigned her appointment, having obtained a position under the Ceylon Government as Supervisor of Telephones, Colombo. Her colleagues at Westminster presented her on leaving with a gold bangle engraved with her name and the date of presentation.

Miss TALLIE CHARMAN, Clerk, Hop Exchange, on resigning her position on leaving London, was presented by the staff at Hop Exchange with a handsome silver-backed hand mirror and a silver-mounted cut-glass scent bottle.

On Miss ALICE BOWLEY'S transfer to the Hop Exchange the staff at Holborn presented her with a gold bracelet.

MARRIAGES.

Mr. A. L. MARGETTS, Contract Office Clerk, Swansea, was presented with a marble clock, suitably inscribed, on the occasion of his marriage recently.

Mr. F. TAGHOLM, Inspector, Swansea, who was recently married, was presented by the Swansea staff with a servicable overmantel.

Mr. F. G. HELYER, Petty Cashier, Guildford, was presented with a marble clock by the Guildford district staff on the occasion of his wedding. Mr. C. G. Ransley made the presentation.

Miss ROSA FLETCHER, who has been operator and supervisor at Portsmouth for twelve years, was presented with a water colour painting on the occasion of leaving the Company's service to be married. The presentation was made by Mr. S. J. Smith, District Manager.

Mr. H. H. BELL, Inspector, Chatham, was presented by the local staff, on the occasion of his marriage, with a pair of framed carbons.

Mr. JOHN H. ROBSON, Test Clerk, Edinburgh, who was married on Dec. 25 last, has been presented with a marble timepiece by well-wishers in the Edinburgh district staff. The presentation was made by Mr. J. D. W. Stewart, District Manager.

OBITUARY.

Miss MARY A. DILGER, Senior Operator, Dublin Exchange, we are sorry to say has passed away after a long illness.

We record with deep regret that Faultsman H. WILLOUGHBY met with an accident on Saturday, Feb. 27, at 9·30, falling some 30 feet to the ground owing to the slipping of a ladder. Death resulted without his regaining consciousness on Sunday at 6.45 p.m. Willoughby had been in Watford centre about twelve months and had acted as faultsman for five months. Previous to that he served for some five or six years in the West Kent and Metropolitan districts. The funeral took place in the Watford Cemetery on March 4. All the line and instrument staff who were able to attend were present, as were the Local Manager, Wayleave Officer, Contract Agent and Storekeeper. Wreaths were sent by the Watford centre and Herts and Beds district.

LOCAL TELEPHONE SOCIETIES.

Birmingham.—At the sixth meeting of the society held on March 2, Mr. Fray, from Head Office, read a paper on "Some Notes on Engineering Construction."

Birmingham Operators.—The sixth meeting of the session was held on March 11, at which Miss E. J. Williams, Visiting Matron, presided. Competition papers were read by the following lady members of the traffic staff (representing Central, Midland, and the Branch Exchanges):—"Teaming," Miss E. Wright; "Operating Ringing Junctions," Miss G. Joyner; "Operating the Company's Private Branch Exchange," Miss E. Braine; "Night Operating," Miss E. Crisp; "How 'A' Operators can help 'B' Operators and *vice versa*," Miss D. Loach; "Operating of Two Positions," Miss N. Bower; "Operating of Trunk Calls on 'B' Positions," Miss M. Spiers; "Operating on 'B' Positions," Miss G. Pool. The following gentlemen undertook to judge the papers:—Mr. E. Williamson, District Manager, Mr. F. G. C. Baldwin, District Engineer, and Mr. H. J. Maclure, Contract Manager. The result of the competition and the prizes to be awarded will be announced at the forthcoming social.

Blackburn.—The fourth meeting of the session was held on Jan. 22, when Mr. G. Stevenson, Chief Clerk, Blackburn, read a paper on the "Returns and their Preparation." Mr. J. F. Abbott, Cashier, was selected to criticise, and from his remarks a very interesting discussion opened out. There were 53 members present, being a percentage of 67 on the total membership.

The fifth meeting was held on Feb. 26, when Mr. G. H. Frost, Engineer, Blackburn, read a paper entitled "Blackburn Underground." Mr. F. Moon, Assistant Engineer, Burnley, was deputed to criticise the paper and a very interesting discussion followed. The paper was illustrated by lantern slides and some excellent diagrams. Sixty-three members were present, being a percentage of 80 on the total membership.

Bolton.—The fifth meeting was held on March 11, Mr. Drysdale, of Liverpool, gave his interesting lecture on "Wireless Telegraphy." Actual demonstrations by apparatus, and a series of excellent slides were much appreciated by the members present.

Bristol Operators.—The fifth sessional meeting was held on Feb. 11, when a lecture was delivered by Mr. R. A. Dalzell on "Operating from an Operator's Point of View." Various questions relating to operating were

asked by the lecturer, and many interesting suggestions were made. The District Manager, Mr. A. Perkins, presided over an attendance of 80 per cent.

Cardiff.—The fifth meeting was held at the St. John's Schoolroom, on Feb. 18, Mr. W. H. Kirk, vice-president, being in the chair. There was a good attendance. This night was devoted to competitive papers on "Instrument Inspection and How to Prevent Recurring Faults," to be read by instrument inspectors. Four papers were read by the following:—Inspectors G. Price, T. H. Griffiths, J. J. Stoney and T. H. Elleby. The papers dealt with the numerous difficulties met with in the course of instrument inspections and the respective methods adopted to prevent recurrence. The first prize was awarded to Inspector G. Price, and the second to Inspector T. H Griffiths. A general discussion followed and the meeting was then brought to a close.

Cardiff Operators.—This society closed its session on March 16 with a competitive night. Forty members (75 per cent. exclusive of the president and vice-presidents) were present, the District Manager being in the chair. Four short competitive papers were given by the Misses W. M. Davies, G. M. Critchett, L. Wheeler and E. Burton; the subjects being respectively "Are Automatic Boxes a Drag on the Service, and Why?" "Quarterly Record of Calls Dealing with Peg Counts," "What is the Primary Cause, from an Operator's Point of View, of 'Cutting Off' Complaints?" and "Has the Operators' Telephone Society been Beneficial or otherwise, and What Improvements can be Suggested?" The Misses W. M. Davies and G. M. Critchett being judged the winners of the first and second prizes respectively.

Cheltenham.—The ninth meeting was held on Feb. 23, Mr. Elliott presiding, when a paper on "Works Orders" was read by Mr. W. A. Taylor, dealing particularly with the loss of revenue due to delay in completion of works orders. The whole available staff and several guests were present.

Dover.—The fifth meeting was held in the district office on March 16, when a paper was contributed by Mr. F. H. Duerth, Local Manager, on "Line and Instrument Work." This was followed by a paper by Mr. P. Mannock, Rentals Clerk, entitled "The Dynamo; a Brief Description." An interesting discussion ensued. Members present, 47 per cent.; visitors, five.

Dublin.—The usual meeting was held on March 10 in the Superintendent's office, papers being read by Mr. A. Lynn and Mr. J. Tyrrell on "Development as Seen from Provincial Superintendent's Office" and "Inspections" respectively. The former paper dealt with the development of the telephone in Ireland since 1878, introducing many statistics and showing by means of a map the relative position with regard to small town exchanges—Post Office and Company.

Exeter.—A paper on "Improvement" was read by Mr. Squire on March 9. Mr. H. Reid presided, and a general discussion ensued.

Gloucester.—On Feb. 25 the fifth meeting of the session was held, Mr. C. Elliott, District Manager, being in the chair. Attendance 100 per cent. and two visitors. Two most instructive and interesting papers were read, illustrated by lantern slides and diagrams, the former very kindly loaned by the Engineer-in-Chief and manipulated by Mr. E. W. Smart. Mr. J. L. de Medewe, Chief Electrician, discoursed upon "Subscriber to Switchboard," giving detailed explanations of the subscriber's apparatus and his circuit to the switchboard. Mr. H. G. Henderson read an extremely well-written paper on "Faults."

The sixth meeting of the session was held on March 11, Mr. C. Elliott, District Manager, being in the chair. Papers on "Underground Construction" were read, and illustrated by diagrams. The first paper was by the Assistant Engineer, Mr. F. W. Sceats, who dealt with the theoretical part of the work leading to the practical portion. The second was read by Mr. H. J. Millett (Engineering, Electrical and Clerical), who, having had practical experience in the drawing of plans and supervision of the underground scheme throughout the Gloucester district, was in a position to discourse upon the actual practical part of the work.

Glasgow.—The seventh and closing meeting of the session was held in the Glasgow Technical College on Feb. 24, when Mr. Valentine delivered a lecture upon "Some Points in the History of the Telephone in this Country." Commencing with the issue of the Graham-Bell and Edison patents, Mr. Valentine traced the history of the telephone enterprise from its earliest stages up to the present day.

Glasgow Operators' Society and Club.—The fifth meeting of the session was held in the Masonic Halls, West Regent Street, Glasgow, on Feb. 22, when in the unavoidable absence of Miss J. F. Rennie, Teacher, Operating School, a paper written by her on "Operators' Training School: Method of Instruction," was read by Mr. Rodger. Mrs. B. M. Peters, Matron, presided.

Thereafter the fifth meeting of the club was held, when a programme of song, pianoforte selections, games and dances was taken part in by the members.

Greenock.—The fifth meeting of this society was held on Jan. 13, Mr. J. A. Swanson, vice-president, being in the chair. Mr. C. R. Rutherglen, Engineer, gave a paper on "Overhead Construction," which was most instructive.

The sixth meeting was held on Feb. 4. Mr. A. Ramsay Lamb, President, being in the chair. The evening was devoted to competitive papers on "The Telephone Service as it Appeals to Me." The prize winners were Mr. Geo. Archibald and Mr. A. W. Grant.

The seventh meeting was held on Feb. 17, Mr. A. Lamb again presiding. Mr. R. Audsley, Local Manager, Paisley, read a paper entitled "Historical Development of Electricity." The paper was very much enjoyed by the large number of members present.

Hastings and Eastbourne.—The second meeting of this newly formed society was held at the Y.M.C.A. Rooms, Havelock Road, Hastings, on March 9. Thirty-four members were present including a number from Eastbourne, with Mr. Curling, their Local Manager. Mr. E. B. Jempson gave a paper on "Local Office Work and Difficulties," and an interesting discussion followed. Mr. E. Armstrong, Local Manager, Hastings, presided. For the next two meetings, in April and May, papers are to be given by Mr. N. C. Bilton on "Batteries as applied to Telephony," and "Maintenance, Overhead and Underground, Records, etc," by Mr. E. Armstrong. The April meeting is to be held at Eastbourne and the Hastings members will journey there.

Isle of Man.—The sixth meeting was held on Feb. 19, when a paper was read by E. H. Vick, Assistant Lineman, on "Telepone Instruments and their Parts," illustrated by diagrams.

The seventh meeting of the above society was held on March 5, when a very interesting lecture by W. E. Cain, Assistant Lineman, was given. The subject was "Magnetism and Electricity," illustrated by experiments.

Leeds.—The tenth meeting of the session was held on Feb. 24, the speaker being Mr. A. L. May (Exchange Manager), and the subject "Electrical Currents." For one and a quarter hours by alternate talk, illustration by black board, and demonstration with apparatus, the lecturer carried his audience along the various phases of his subject.

Liverpool and Birkenhead.—The sixth meeting of the session was held on Feb. 23, Mr. Hidden presiding. A paper was read by Mr. Crowley on "Common Battery Private Branch Exchanges." Mr. Crowley dealt with this subject in a very able manner, and answered a number of queries raised in the discussion which afterwards took place.

The seventh meeting of the session was held on March 18, Mr. Hidden presiding, a very interesting paper being read by Mr. Wolstenholme, District Engineer, on "Engineering Costs, etc." A number of slides were shown in connection with the paper, and in the discussion which afterwards followed some very interesting points were raised, all of which Mr. Wolstenholme answered.

London.—A general meeting of the society was held at Salisbury House on March 1, with an attendance of 75 members. Mr. H. Davis was in the chair. Mr. Harvey Smith (Metropolitan Engineer's officer) read a paper entitled "The Technical Side of Development Study," showing and fully explaining some very interesting slides relating to the plotting out of junction areas, transmission difficulties, cost of direct and centralised systems, results of having two allowances for one area, etc. A discussion followed, in which the following members joined:—Messrs. J. F. Edmonds, L. Harvey Lowe, J. Bryant, A. Watts and J. Stirling. A junior competition will be again established this session, and the prize papers read on April 28. Junior members up to an age limit of 25 years are invited to write a paper on "Office Work," "Electrical Work," "External Engineering," "Operating." Prizes value £1 1s. will be offered for the best paper on each subject.

Luton.—On Feb. 18 Mr. N. A. Saltmarsh, Local Manager, Watford, gave a paper entitled "The Local Office." A fair percentage of members were present under the chairmanship of Mr. J. H. Wilson. The discussion which followed was well sustained.

Manchester.—On Feb. 19 a paper was read by Mr. W. Cleary on "The Cable Lay-out of the City Exchange," describing the laying of pipes and cables, lacing out, and method of numbering; illustrated by slides.

Friday, March 5. Open night for members' papers. Three papers were read, viz., "Portable Voltmeter Testing," by Mr. J. Magnall, which gained first prize, value 10s. "The Engineering Work of a Distributing Pole," by Mr. C. F. Chambers, gained second prize, value 5s. "The Common Battery Instrument," by Mr. A. Jackson, showed the theory of a common battery instrument.

Newcastle, Sunderland and South Shields Branch.—The fifth meeting was held at Sunderland on March 5. Mr. E. Spink was in the chair. A paper was given by Mr. J. Martin entitled "Clerical Work in Connection with the Company's Business." The speaker dwelt upon the following items:—Reason for commercial department, the various departments of the Company, description of the work of each department, office routine, duties of a clerk.

Newcastle.—The fourth meeting was held on Feb. 18, Mr. J. P. Urwin in the chair. There were two papers, the first of which was given by Mr. E. Spink, on "Knots and Bends as Used by the Company's Workmen." It was illustrated by knots, which were passed round amongst the members, and a post on which was shown the means of fastening ropes to any object. The principle of levers was also shown on the blackboard. The second paper was given by Mr. J. Reay, on "Construction of Field Telegraph and Telephone Lines as Used by the Army in South Africa."

Nottingham Factory.—The seventh meeting took place on Feb. 22, Mr. C. E. Fenton in the chair. Mr. A. E. Ault gave a short paper on "Workshop Practice," his remarks being aimed at benefiting the junior members of the society. Hints were given on filing, screw-chasing and vice work. Mr. W. H. Buxton then gave his paper on "Cabinet Shop Troubles," dealing with some of the difficulties experienced during repairs by the Cabinet Department of the Factory. Although the Cabinet Department are very much in the minority, Mr. Buxton was complimented on the interesting way in which he made his difficulties clear.

Portsmouth.—On Feb. 23 Mr. J. H. Yates read his paper on the "Erection of Lead-covered Cables." The lecturer made several very important points. One which was discussed will be the outcome of a suggestion to be sent to the Engineer-in-Chief *re* "pig skin binders." This paper was awarded first prize. A discussion ensued and was taken part in by the chairman, Mr. S. J. Smith, Mr. Legge, Mr. Pharo and Mr. Lees.

The telephone society have brought their session to a close, and a general meeting was held on Feb. 23. The affairs were considered to be in a satisfactory state, and prizes for the best papers were awarded to—First, Mr J. H. Yates, for his paper on "Erection of Lead-covered Cables"; second, to Mr. J. Lees, for his paper on "Central Battery Working"; and the third to Mr. H. Legge, Engineer, for his paper on "Cables and Transmission."

Plymouth.—At the meeting on March 10 the chair was occupied by Mr. R. A. Dalzell, president of the society, and after an address by him, Mr. J. Ritchie, Contract Officer, gave a paper entitled "The Securing of Contracts." Afterwards a paper on "The Value of Periodical Inspections" was read by Mr. B. H. Sanderson, Instrument Inspector. Both these papers brought out some useful and interesting points.

Sheffield.—A successful meeting, which was held on March 5, took the form of a "Lantern Evening," at which were shown some 200 slides, including a number kindly lent by the Cunard Steamship Company and Head Office, the remainder being contributed by members of the local staff.

Southern (London).—The monthly meeting of the society was held on Feb. 16, when a paper was given by Mr. F. M. Ward on "The Ringing Dynamotor and Its Uses." The paper dealt with various uses of this machine, and was well explained with the assistance of several slides. An interesting description was also given of party line subscribers' circuits and apparatus.

Swansea.—The sixth and last sessional meeting of the Swansea Telephone Society was held at the Dock Exchange Hall on March 17, Mr. W. E. Gauntlett (District Manager) in the chair, when competitive papers written by members of the society were read. The names of those competing and the subjects were Mr. J. C. Jenkins on "Ten Party Lines: Past, Present and Future." Mr. W. A. Elliott on "Measured Rate Recording and Bookkeeping." Mr. P. S. Taylor on "Some Details of Local Office Working." The papers were well written and discussion took place after each.

Truro.—On Feb. 10 Mr. A. H. Mansfield read a paper on "Local Centre Working," 83 per cent of the members being present. This paper should have been given on Jan. 20, but Mr. A. E. Ball, Plymouth, read a paper on "Works Orders and Stores" on Jan. 18, which made it necessary to alter the date. On March 8 Mr. F. A. Sowerby, Instrument Inspector, Truro, gave a paper entitled "Exchange Fitting and Maintenance," 66 per cent. of the members being present.

Tunbridge Wells.—The fourth meeting of the session was held at Ralph's Restaurant, Oxford Terrace, on March 9, a most interesting lecture on the "Tunbridge Wells System" being given by Mr. Rathbone. The District Manager (Mr. S. C. Smith) occupied the chair.

Western (Metropolitan).—The usual monthly meeting of this society was held at Gerrard Exchange on Jan. 14, when Messrs. E. H. Milne and F. H. Hayden read papers entitled "Central Battery Instruments." The former gave a description of the various types of central battery apparatus and circuits, and Mr. Hayden followed with details of faults and the method pursued in locating and clearing them. Many illustrations were shown by means of lantern slides.

Wolverhampton.—The February meeting in connection with the above was held on Feb. 19 at the Town Hall Restaurant, Wolverhampton. Seven short competing papers were read by Misses Attwood, Robinson and Turner, and Messrs. Babb, Harrison, Law and Nock. The chair was taken by Mr. Archer W. Smith, the number present being 40.

STAFF GATHERINGS AND SPORTS.

Herts and Beds.—The Luton and Watford staffs have recently played two football matches. At Luton, the home team won, 4 goals to 0, but at Watford, the visitors were defeated by 4 goals to 3.

Edinburgh.—The Edinburgh district staff held their third whist drive for the season on March 1. Sixty players took part, the prizes being won by Miss A. Taylor, Mrs. G. Colquhoun, Mr. W. Tait, Mr. H. J. Radcliffe, and Mr. C. M. Macfarlane. Two prizes were kindly given by a friend present.

Truro.—The first annual dinner of the society was held on Feb. 26, at Beare's Hotel, Truro, the whole of the Cornwall staff being present. The chair was taken by Mr. G. Hooper (District Manager, Plymouth, and president of the society), Mr. J. Wilkinson (vice-president) acting as vice-chairman. After dinner a smoking concert was held, and the following contributed to the programme:—Messrs. G. Chapple, A. H. Mansfield, F. A. Sowerby, W. F. Wilson, A. Addison, W. S. Griffiths, H. W. Roberts, J. Ritchie, F. Beare, jun., S. Drew and J. Macdonald (Post Office, Truro). A special vote of thanks was passed to Bandmaster H. Phillips, Truro, who rendered a cornet solo. Mr. E. Tanner was at the piano.

Guildford.—On Feb. 27, in a sharp atmosphere and on a snow-covered ground, a football match was played by Guildford *versus* The Rest of the District. A keen and well-contested game was fought out, which resulted in a win for the latter by 3 goals to 1. The District Manager, who kicked off at 3.30 p.m., was an interested spectator together with a good number of the staff. Although the weather was very frosty the spectators were kept warm by several exciting incidents which happened during the game, one especially, when an old Rugby player, forgetting for the moment he was playing under Football Association rules, tried to stop an opposing forward by hugging him round the neck. After the match the staff adjourned to the "Prince of Wales," where an excellent tea was provided and thoroughly enjoyed by over 50 members. This was followed by a smoking concert, at which Mr. C. G. Ransley presided as chairman.

Hants and Dorset.—The return football match between the Southampton and Winchester staffs, which took place on the ground of the Union Castle Athletic Club at Southampton on Feb. 20, resulted in a win for Southampton by 5 goals to 1. The visitors were afterwards entertained to tea at the Highfield Hotel, which was followed by an enjoyable smoking concert presided over by the Local Manager, Mr. J. H. Gwyer.

Maidenhead.—An eminently successful smoking concert was held by the staff of this centre on Feb. 13 last, the company present numbering over 40, including about twenty friends from the Windsor and Reading staffs. The chairman—Mr. T. C. Rhodes, Local Manager—had the management of an excellent programme, every item of which was thoroughly appreciated. Noteworthy features included a topical recitation, "A Life on the National Telephone Company," by the author, W. A. Williams, who also gave in response to an encore "A Telephone Heroine," from the NATIONAL TELEPHONE JOURNAL; an original song, "Wake up the Staff Transfer Association," well rendered by A. G. Matthews, and a sailors' hornpipe and mandoline solo by W. Rich.

Dublin.—On March 17, St. Patrick's Day, the telephone cycling club held a social evening and dance in the St. Lawrence Hotel, Howth. A very enjoyable evening was spent. The hon. secretaries were Messrs. McShane and Manning.

London (Western).—On Feb. 8 the staff of the Western contract office held their second annual dinner. In the unavoidable absence of Mr. Clay, who had promised to preside, the chair was taken by Mr. L. Harvey Lowe. A very excellent concert was given under the direction of Mr. F. A. Cairns, Chief Contract Officer, and the thanks of the staff is specially due to Mr. Cairns's brother, who is not in the employ of the Company, for the valuable assistance rendered by him in organising the programme and procuring the services of several first-class artistes.

Glasgow.—The annual Cinderella dance was held in the Trades Hall, Glassford Street, on Feb. 13, over 70 couples being present. The music was provided by Mr. Carl Miller's Scarlet Band, and altogether, the arragements for this social event reflected great credit on the committee, and Messrs. Ferguson and Grace made highly acceptable M.C.'s.

Liverpool.—*National Telephone Swimming Club.*—The annual general meeting of the members of the above club was held in the district office on Feb. 11, Mr. E. J. Hidden being in the chair. The progress of the club during its first season has been most satisfactory, and there is every indication of an even more successful season this year. The principal business was the election of officers. Mr. Hidden, the retiring president, who has always taken a very keen interest in the club's affairs, were unanimously re-elected and a very strong committee and executive was also appointed. A proposal that a life-saving class should be formed was approved, and arrangements having now been completed the first batch of aspirants for the Royal Life Saving Society's Bronze Medal and Certificate will be ready to undergo examination by the end of May next. In this connection the committee are indebted to Mr. H. W. Johnson and Miss Finegan, who have kindly come forward with an offer to train the members. The annual staff dinner was held on March 13 at the "Bear's Paw" Restaurant, the District Manager, Mr. Hidden, taking the chair, Mrs. Hidden also being present. A very excellent musical programme followed, the items principally being given by members of the staff and their friends. During the evening opportunity was taken of presenting Mr. Godrey, the Chief Clerk, with an oak bureau, and Mrs. Godfrey with an oak music stool, on the occasion of the former's transfer to Manchester. In making the presentation, Mr. Hidden, on behalf of the staff, remarked that Mr. Godfrey was leaving with the best of good wishes for his future welfare and success from every member of the Liverpool staff; and, in responding, Mr. Godfrey said that if he could look forward to the same loyal support in his new position as he had received in Liverpool, his success would be assured. An opportunity was also taken of introducing Mr. Lee, who has been transferred from Oldham to take up the position vacated by Mr. Godfrey. A pleasant and enjoyable evening was brought to a close with a vote of thanks to the chairman, proposed by Mr. Prout, the Assistant Superintendent, and seconded by Mr. McLean, the District Manager, Birkenhead.

Belfast.—A concert was held by a number of the staff in the I.O.G.T. Hall, Wellington Place, on the evening of March 4, under the chairmanship of Mr. Pulford. An attractive programme was rendered and the following artistes took part:—The Misses Conway and Patterson and Messrs. J. Gilmour, Robertson and Cassells. A number of selections were also given by Mr. Pulford on the pathephone and were greatly enjoyed. At the conclusion of the concert an hour's dancing was indulged in and a very pleasant evening was brought to a close about 11 p.m.

Maidstone.—The Maidstone staff played the return football match with the Dover staff at Maidstone on March 13. A very keen game resulted in a draw of 1 goal each. The visitors were entertained to tea at the Maidstone Restaurant, and at a concert which followed the staff from both districts contributed some very entertaining items.

Tunbridge Wells.—On Feb. 20, a ten and a half miles walking match took place through Eridge, Groombridge, Langton, etc. The weather was ideal and a splendid race was witnessed, the first five men home being R. Richardson, 1 hour 47 minutes; W. Denton, 1 hour 49 minutes; S. G. Bocking, 1 hour 50 minutes; S. J. Simon, 1 hour 54 minutes; A. C. G. Jones, 1 hour 52 minutes. The prizes were presented by the Local Manager (Mr. A. L. Curling) at a smoking concert held at the Camden Hotel in the evening. The race was under sealed handicap conditions, and the winners were as follows:—First, R. Richardson (silver watch); second, W. Denton (calabash pipe). A special prize—set of gold cuff-links—was presented to A. C. G. Jones, who is only fifteen years of age. The following members of the staff very kindly contributed to an enjoyable musical programme:—S. G. Bocking, W. F. Rathbone, G. Baker, D. Jordan, H. Fowler and E. Crate.

Portsmouth.—The last of a series of whist drives in connection with the Portsmouth staff was held at "The Cadena," on March 10, when about 150 of the staff and friends sat down to a very enjoyable evening. The committee, as usual, acquitted themselves in such a manner as to give satisfaction to all who took part in this very pleasant evening. A wish was expressed on all sides that these entertainments be continued another year. The prizes were presented by Mrs. Smith (wife of the District Manager, Mr. S. J. Smith).

On March 13 the entertainment committee organised a walking match for the members of the Portsmouth staff, commencing at "The George Inn" on Portsdown Hill, and taking a five and a half miles circular course, finishing up at "The George," and coming *via* Stakes, Waterlooville and Purbrook. Twenty-eight competitors faced the starter, Mr. S. J. Smith, District Manager, and the distance was covered in the very excellent time of 51 minutes—Mr. H. Newham, Service Inspector, being first; Mr. C. Gardner, Jointer's Mate, second; and Mr. H. Shannahan, Jointer, third. The prizes consisted of pipes, razors, and tobacco pouch. These were distributed by Mrs. S. J. Smith. This is the first of a series of these outings which the committee hope to organise for the coming season.

The Telephone Masonic Lodge.—At the regular meeting in February, Messrs. J. T. Tattersall, F. Woollard, C. F. Arrowsmith, E. A. Pettithory, and C. W. Appleby were initiated; Bros. G. H. Goldsmith, F. C. Hawker, W. V. Pegden, C. Elliott and J. A. Hunt were advanced a stage; and Bros. J. M. Shackleton, F. W. Francis, H. J. Maclure and Arthur Watts were advanced to Master Masons. Messrs. H. M. Darville, H. M. Pease and R. Bumiller were nominated candidates for initiation. W. Bro. Kipping, S.W., was unanimously elected worshipful master and Bro. C. E. Tattersall was re-elected treasurer for the ensuing year. The installation of the worshipful master will take place at the next regular meeting, which will be held in May.

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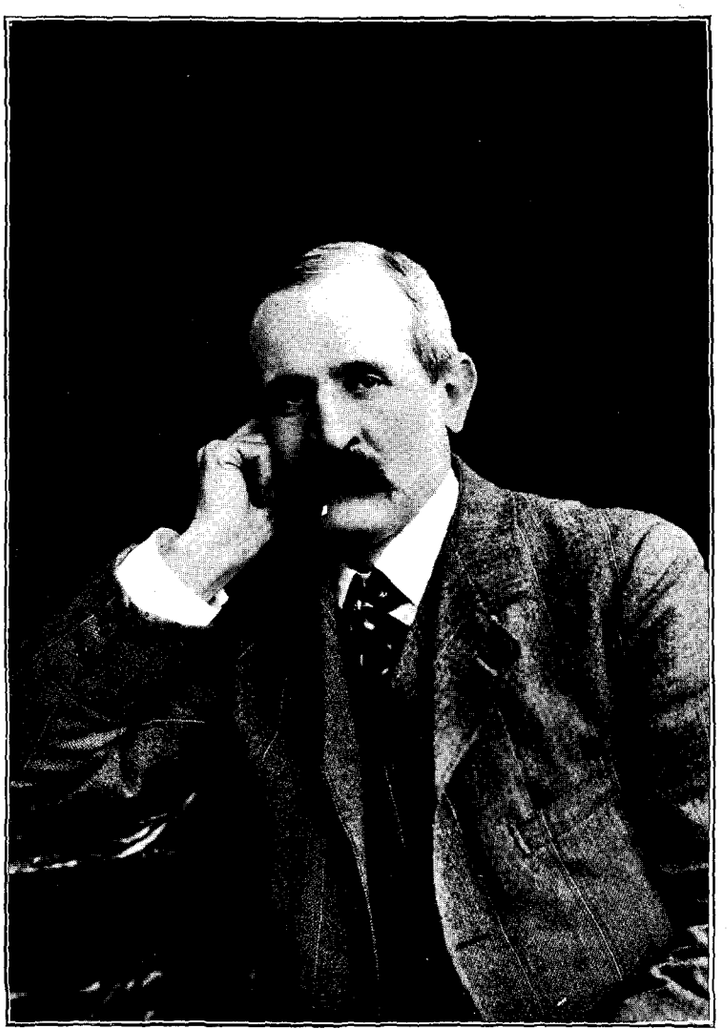
TELEPHONE MEN.

XXXVI.—HERBERT BARON SUTCLIFFE.

HERBERT BARON SUTCLIFFE was born at Todmorden, in Yorkshire, on March 18, 1860. In 1864 he removed to Burnley, where he was educated at the Burnley Grammar and other schools. Mr. Sutcliffe has in his time followed many crafts. After a short experience in the drapery business he tried his hand as a schoolmaster. This profession he relinquished after some eighteen months' experience, and entered the then new branch of the Lancashire and Yorkshire Bank, Limited, where he remained seven years, rising from junior clerk to first teller. The prospects there, however, left him small inducement to stay, so that in 1882 he went to Canada, intending to take up land, but the work was not congenial, and Mr. Sutcliffe next filled positions of various kinds on the Canadian Pacific Railway. In this company he began to gravitate towards the work which has filled the greater portion of his life, for, among other occupations, he assisted in the reconstruction of the telegraph route along the railway, and was at one time assistant paymaster of the western section of the railway itself. In July, 1884, he returned to England, and in the October of the same year entered the service of the Lancashire and Cheshire Telephone Company under the district management of the late Mr. J. A. Chambers, and was put in charge of the Burnley Exchange, where a 50-line Gilliland board was installed with about 25 subscribers.



Efforts were made at various periods to open exchanges in the neighbouring towns — Nelson, Colne and Paddiham—but at that time, even after a year's gratuitous service, the public would not have them. Matters are very different in that busy community to-day.

On the removal of Mr. J. A. Chambers to the district managership of Bradford in 1890, Mr. Sutcliffe was chosen as his successor at Blackburn, the district at that time comprising what are now known as the Blackburn and North-West Lancashire districts. He remained at Blackburn two years, where he had the somewhat unique experience of having a discussion with the late General Manager, Mr. Gaine, who was then the town clerk of Blackburn, with regard to the then existing telephone rates.

On the unfortunate death of Mr. J. A. Chambers in 1892, Mr. Sutcliffe was again chosen as his successor at Bradford, and has remained there ever since. At that time the district comprised practically the whole of Yorkshire, with the exception of the Sheffield district, and the works dealt with at that time were, as the advertisers say, "too numerous to mention," but amongst them may perhaps be quoted the removal of the Bradford and Halifax Central Exchanges, the building of new premises at the former place, and the completion of underground schemes at both places, at Keighley and at other small places. Mr. Sutcliffe has had his share of the usual breakdowns, etc., to deal with, but owing to the general extension of underground work, troubles from this cause are happily of less magnitude than they previously were.

As for recreation, he has always been and still is interested in golf, bowling, cricket and football.

There is no doubt that Mr. Sutcliffe is not only keenly interested in his work, but that this keenness also extends to his staff.

He is always prepared to spend any amount of time, and to throw any amount of energy and enthusiasm into projects which will either add to the mental and practical equipment of those under him, or promote their welfare and comfort.

OFFICE WORK AND ITS RELATION TO TECHNICAL STAFF.*

BY L. PARSONS, *Chief Clerk, Brighton.*

I HAVE heard, very often, technical men, and more particularly outside men, jeer at the office, as much as to say, "Well, the Telephone Company could get on all right without the office, but they cannot get on without the lineman or the instrument fitter." There was never a greater mistake made. It puts me somewhat in mind of a little tale I heard a short while ago. I daresay some of you have heard it before. An old lady went to London during the Japanese War; she was an unsophisticated old party, and while walking down Whitehall she saw a crowd of people outside the War Office, and she turned to a bystander and said "What is the matter here to-day? What is all the crowd for?" And the man she spoke to said, "Well, they're all waiting for news of the Japanese War." She said, "The Japanese War? Who are they at war with?" "Russia," was the reply. "Russia! and I never heard anything about it. Oh, well, they've got a fine day for it, haven't they?" Well, these remarks the technical men pass about the office have just about as much application to the office as that remark of the old lady about the Japanese War.

The office can be compared to the hub of a wheel; I daresay most of you know something about bicycles, and you know very well that a good deal depends upon the hub, and if there is a fault in the hub it causes trouble. So it is with the office; the office is the hub of the system; no department can get along without the office any more than the office can get on without the other departments, and it behoves the office staff in the first place to see that their duties are performed rightly.

Sometimes you cannot read what an office man writes; it happens here sometimes. Some write in such a way that although their writing is almost undecipherable, it is what one office man in Brighton used to call "classy." I suppose he meant it was the way doctors and clergymen write. Then with regard to figures, it is a most important matter that office people should be plain in these. Now, as an instance, I came across a figure one day last week, I didn't know at first what it was—whether it was a figure or something else. It resembled the shorthand equivalents for the words "early" or "assume," or it could be taken for the mark of a dirty fly, or by a violent stretch of the imagination it could have been taken to mean what it was intended for—the figure two.

I consider, taking the simile of the wheel, that every department is a spoke; taking the District Office as the hub, we get the Local Office as one spoke, the Instrument Department as another, the Line Department as another, the Stores Department as another, and so on, and to finish the construction of the wheel, I take the Operating Department as being the rim and tyre. That department is the one which manifests itself to the view of the public and the subscribers, and in that sense it may be said to roll over the ground. Well, now, every part of that wheel requires to be in order so that the wheel may run true, and every spoke and every part of that wheel reacts on all the others. There is no such thing in the telephone world as a watertight compartment; we cannot shut ourselves up in the office and say we are independent of everybody else. The instrument fitter cannot go out and fit instruments and think to himself that he is independent of the office and the line staff and everybody else; they are all interdependable.

I should like to say just one word here to the office staff. I have not much patience with either office people or people of other departments who show no ambition whatever. Now we have not much more than three years to run before we are swallowed up by the Government, and then what is going to happen to us all? Those of us who can put forth our energies outside the department in which we have been brought up will, I suppose, get on much better than those who have been shut up in what I called just now a watertight compartment. The Post Office is constructed rather differently from our own organisation. In the office here we are office men pure and simple, but if you go to the Post Office you find—especially in the Telegraph Department—that you must not only be a clerk or a telegraphist, but also have some knowledge of the Technical Department. And so it should be with our organisation here. I think that all members of the office staff ought to acquaint themselves very largely with the construction of our technical instruments, in order that they may be able to cope with the competition which they certainly will have to cope with in the future. Of course I know some—particularly the young fellows—say they have had enough of office work in the daytime; they don't want to do anything else at night. But I do not know where I should be to-day if I had always been so minded. But I do not think I need say any more to the office staff. Well, now, to speak more particularly to the technical people; they come into the office sometimes and they tackle the cashier, and think they are going to get money and all sorts of things from him without going through the proper performance. The cashier is a man bound by iron rules, and he has to stick to those rules or get into trouble. It is no good for a man to come in with an expenses sheet saying he is in a hurry to catch a train, and that he must have the money. He will not get it unless the sheet is properly certified. How many times have I seen men try to get money out of the cashier—money which was legitimately due, no doubt—but without going through the proper channel of certification. The same thing applies to other things—tradesmen's accounts that have been paid perhaps by men out of their own pockets, but it is no good bringing them to the cashier expecting him to pay them if not certified by the local manager. The cashier would be absolutely foolish to pay money under such circumstances, because he never knows when somebody is going to "drop" on him to see what he has paid.

The main thing with regard to our office work is the works order. The works order is what I may call the link between the office and all the rest of the staff. Well, now, with regard to the works order, the office staff is absolutely at the mercy of the technical staff.

It should always be remembered that errors in works orders mean perpetuation of errors in records. If you get a wrong date on a works order, you get a wrong due date for the rental, and perhaps the Company may stand to lose (in large cases) pounds, through one simple error. With regard to materials you see all sorts of funny things on the back of green slips, and I think the works orders which show the queerest things are those relating to fire insurance. Now, those members of the local office staff present can appreciate what I say, I am sure, and they know as well as I do what an immense amount of worry these fire insurance works orders are to myself and to members of my staff. We get a fire insurance works order issued to repair damage done by a thunderstorm at a certain exchange. When the men do the work they find, perhaps, that there are six indicators fused. Well, when we consult the back of the green slip in making up the account to render the claim, we find, perhaps, that there are six indicators booked out and a dozen booked in. Now where on earth they get the dozen from I don't know. That is a thing we have to refer the order back for, and then it has to go through all the stages of enquiry before we can get it settled. The consequence is we get a sharp letter, perhaps, from the Secretary to know why we are delaying sending in these claims, whereas, by the exercise of a very small amount of care in the first place, the whole difficulty should have been avoided. It is obvious that if six indicators are fused, and six new ones are put in, six old ones must be recovered.

Some time back, before the works orders were checked in the local offices to the extent they are now, some very curious things happened. Take, for instance, the case of man-hours estimated. We have a labour slate in each of our local offices; until quite recently it was the usual thing to find the "Man-hours Estimated" column blank. I do not know how it is, but the clerk and others who were concerned in it seemed to think that the column was put there to look at, and not to use. I remember a case where some works orders were returned, and the space devoted to man-hours estimated was blank. When the local office clerk concerned was tackled on the point he simply struck out the odd hours actually worked, say, there were 24 hours worked, well, he simply struck off four and put twenty in the "man-hours estimated" division, and he thought that was much the easiest way of getting over the difficulty. Of course, he said, if he had to estimate it before, it meant *time*; why, of course it did. Talking about estimates, some time ago it was noticed that in sending in a revenue estimate for eleven consecutive months the same item was included, and that was for a small job of shifting a pole. Well, eleven months elapsed and that work had not been done, and then it was suddenly resolved that the work never would be done, and when the local office concerned was consulted on the point the only explanation was that the man who made up the estimate was told to copy the previous month's estimate always, and he did so, but did not know what it was all about. I do not know what he would have done if he had to estimate anything fresh; he would probably have gone mad. On one occasion there was a green slip missing, and when it eventually turned up after a lot of enquiry and searching, it was in many pieces—squares they were—so that it had evidently been carefully packed up and put in the fitter's pocket, and the creases had gone through the green slip so that there were as many pieces as there were folds. The man put it together with some stamp edging, but in doing so he jumbled the pieces up. The consequence was that some were upside down and some crossways. The cost clerk made the remark that he supposed the man did it on Friday night after he had been paid.

It is absolutely necessary for everybody to consider that works orders should be completed as quickly as possible, because the more quickly they are completed, especially with regard to works orders for new lines, the sooner will the Company begin to reap benefit from the work that has been done. It is not fair to the Company that any delay should take place which will cause it to lose money. If a works order is bottled up in the local office and is not got on with as quickly as it might be the result is that it is not returned to the district office so quickly as it should be. Perhaps it is a month late; well, now, you take the case of a works order which carries with it a rental of £12 a year; if that works order is delayed a month unnecessarily, that means a sovereign out of the Company's pocket. Suppose there are two works orders in each district delayed a month like that all over the country; there are 54 districts in the kingdom, and if there were two in each district, it would mean a loss of £108. We are a little bit inclined some of us to think parochially and so we do not sufficiently realise the fact that we are only a small piece of the whole, and that we are all of us to act in such a way that by every possible means in our power our little part in the whole shall work perfectly, and if all districts would do the same the result would be much more satisfactory to the Company. Of course, it is necessary where works orders are delayed that the cost clerk shall be kept posted as to the causes of the delay, so that the information can be kept at the disposal of the office and matters explained to the public or to the prospective subscriber, in order to avoid any friction.

Some curious things happen with regard to stores. It is necessary for all members of the staff to have some small smattering of office knowledge; it is particularly so in the case of stores, because we find in practice the absence of such knowledge causes a lot of trouble and endless worry to the members of the staff, and more particularly to the stores clerk. If the stores clerk does not happen to be a conscientious man and well up in his work the consequences are disastrous. I remember once in the old days of the South of England Telephone Company there was a case where a little clerical knowledge resulted in dishonesty. Now we do not want it to do that. In the days when this occurred the accountant of the Company used to go round every few months to the different centres and check the stores, and he did it in what our auditors nowadays would call a very perfunctory fashion. On one occasion I remember he went to a certain district office centre and checked the stores there, and told the district manager that he was going over to another centre under his control the next day. The

* Abridged from paper read before the Brighton Telephone Society.

district manager knew very well how things were in that centre—they were all at sixes and sevens. However, his knowledge enabled him to hire a donkey and cart that night and cart very nearly all the stores in that centre over to the next, so that when the inspector got there the next morning he counted the very same stores that he had counted the day before. This could not, of course, go on for ever, and he was eventually discovered. It is highly necessary that knowledge should be applied properly, and we do not want to display it in such a fashion as to enable a man to use it dishonestly. One great fault we find with the Stores Department (of course the Stores Department is one of the spokes of this wheel) is that they do not sufficiently appreciate the fact that they do not want to keep a lot of stores on hand that they are not going to use; and there are means at their disposal of getting rid of stores—that is by transferring them to another centre, where they can be used, and therefore all such stores should be put on the transfer list as quickly as possible, so that Head Office can direct where to send them to the best advantage. Then there is another matter that requires attention, and that is the disposal of scrap; scrap copper wire, scrap bronze wire, scrap cable, and all that sort of thing. I remember in the old days when scrap was brought back, it was not even booked, the men came in with it, perhaps a cart load of it, pitched it into the stores on the ground, and there left it. Someone might pick some of it up and put it into his pocket. If he did, well, nobody would be the wiser. Well, nowadays, it is booked in as other stores. Scrap copper and bronze has a good value, and in many cases it is sold for as much as it originally cost. Therefore, it is a thing which deserves a little better attention than it often gets. I often think with regard to line repairs that when a man has to pick up a span of wire, he books out a certain amount of bronze or copper, as the case may be, at the same time the amount of old copper or bronze recovered ought to agree to a very large extent with the amount of new wire put up. Of course there is sure to be some slight discrepancy owing to the action of the air on the old wire, under which it would lose some of its weight, but approximately it ought to be the same as the new wire. Then, with regard to the description of stores; there is almost an ineradicable tendency on the part of the line staff to call things out of their proper names. The names of things have been properly fixed by Head Office, and they are properly described in the stock list, and a foreman, if his men are ignorant, should be able to correct any mistakes which they may make on that point. Take an instance which occurred last year; there were two pinchers booked in; they were booked in as "pinchers"; they remained on our books until some time this year (I forget what month) and then they were booked out; but they were not booked out as "pinchers"; Oh, dear no! they were booked out as two pipe snips. Well, now, if our stores clerk had not happened to be a man who knew a little about stores he would have been at sea, but he had been a storekeeper himself years ago so that he gave a guess as to what was intended, and he jumped to the right conclusion, and after a little enquiry was able to put that right. But even there you see he wasted his time; then, again, men will insist on calling 4-inch and 6-inch draw vices "dog vices"; why dog vices I don't know; it seems to me that they might just as well call them "cat" vices. And they will also insist on calling rammers "punners"; well, punner may be a proper name; I don't know, but we don't call them punners; the Company call them rammers, and it is incumbent on everybody who deals with stores to call things by the names that the Company calls them. There is another thing, they call ⅝-inch swivels "stay tighteners." They may be stay tighteners but they should not be called so by the men.

In regard to time sheets many errors crop up; of course a good many of them are discovered and put right before they reach us, but on the other hand a good many are not, a good number reach here, and it is highly amusing often to see a sheet with a number of errors in it—obvious errors which anyone can see—and yet that sheet has got very likely half a dozen initials on it to show that it has been checked—it has got pretty well every word on it ticked to show that that word has been checked, and yet for all that it comes to the district office in that state. This remark applies also to expenses sheets. I frequently have seen expenses sheets come in with at least four initials on them, and every item ticked with a blue pencil or in red ink, or something or other to show that it has been most carefully gone into, and yet when I come to overhaul the sheets at the finish I find they are all wrong and have to be thrown out before they can be presented to Head Office, and it often means the refunding of money by men or the paying of more to them. I particularly notice that men are always prone to say nothing if they have got too much, but "kick up a row" if they have not got enough. It is highly necessary with regard to gang sheets and fitters' time sheets that full details should be given of the work, and there again a good many fail. We do not get sufficient details in many cases. I do not mean to say we want such details as sometimes we have got. For instance we get a gang sheet sometimes showing such trivialities as "filling coal scuttle," "winding clock," "cleaning window," and I remember some time back when we had a certain man on the Brighton staff who was very slow in all his movements; this man used to send in five or six sheets every day, and practically accounted for every minute. It is quite unnecessary that we should have such trivial details as that, but it is necessary that we should have sufficient particulars to recognise what work has been done. One amusing remark was: "Casual man taken on to run a sub." Then the local office "spoke" sometimes comes in by not compiling the number of hours properly, and that is productive of a good many hours' work in the district office. Some works orders are filled with initials and ticks and some minus everything, and then of course they have to go back to have the omissions filled in. Another source of trouble with regard to time sheets is, that when men work overtime they do not put it in the same week as they work it; it is put in the following week. Various excuses are put forward, but to my mind none of them hold water, and when a man works overtime he should be paid for it the same week that he works it.

There is one little point which I hope everybody will take to heart, and that is with regard to correspondence. It frequently happens that when we send a memorandum to the local office asking a question, that memorandum is attached to a sheet of foolscap, or some other kind of paper, and "Mr. So-and-so, for report, please," written on it; well, Mr. So-and-so refers it to somebody else for his report; that gentleman refers it back to the original party with his report, and then it comes back from the local office. Well, that would be all right if these various reports were written intelligently, but in many cases they are written much in the same way as that figure two. It might be a fly crawling over the paper, and sometimes the writing is done in such a microscopic fashion that I want to take my glasses off and use them as magnifying glasses and see what it all means. That gives us a lot of trouble, but what makes it worse still is that these pieces of correspondence are dealt with in such a way that they get all four corners turned over—dog-ear fashion, each dog-ear bearing microscopic caligraphy. With regard to operators, as I said just now, I look upon the Operating Department as the rim of the wheel. If the spokes and the hub are wrong the rim is going wrong, but I am glad to say that so far as this district is concerned, the rim itself is in absolutely true condition, or as nearly true as it is possible to get it. We know that the Brighton Operating Department hold the proud position of being at the top of the tree in the country for speed in dealing with calls. I can distinctly remember when the operating was a source of annoyance to everybody—subscribers and the Company both. For instance, I remember on one occasion a complaint was made that the operator did not ask the caller to put a penny in the automatic box, and when the district manager tackled the operator herself, she said she was too busy to ask for the penny. Then on another occasion the same district manager had occasion to suppose that the operator was listening to what he was saying, and when he told the operator to get off the line, she replied "Oh! I'm not listening." We can congratulate ourselves on the fact that these little relics of the past are *only* relics. The relations between the district office and the local office are things which require to be thoughtfully considered, because it often happens that if the greatest friendship and co-ordination does not exist, we are apt to get into a bad state; more particularly that refers, I think, to the matter of the local office seeing that all these various papers that have to come to the district office have gone through all the proper channels, that they bear all the certification marks that they should bear, and that they come in at the proper time. One thing which the local offices, I think, ought to give a little more attention to is the Correspondence Class papers. Of course, the Company have instituted these classes, and it is only fair that every facility should be given for the papers to bear their proper marks; if these papers come in late, and are sent to London late, the students concerned stand to lose their marks. In nearly all cases the papers could be obtained by the efforts of the local office in time for them to bear their marks.

It is incumbent on everybody to remember that without the office the Company could not exist, and it is not until the office deals with matters that the Company begins to reap any benefit from any work that has been done. When a works order is completed for a new line, the Company gains no benefit from that work until that works order has been properly entered in the books, the rental account rendered, and the rental obtained. As soon as this is done, of course, the Company gains all the benefit it can.

One of the returns which we have to render to London monthly is what we call the No. 2 return—rentals outstanding. Well, now, everybody on the staff has an interest in that return; we also have to renuer a weekly statement, which we call the finance statement, and both the No. 2 return and the finance statement show the percentage of outstanding rentals to the total rentals of the district, and if this percentage rises to above a particular figure, we are immediately called over the coals by Head Office. And it does not always depend on the office to get rentals in; that is what I want to impress on everybody. If a subscriber's line is continually getting out of order that subscriber "gets his back up," and when he is asked for his rental he will perhaps say, "Oh yes, I will pay my rental when I get good service." So you see it is to everybody's advantage to endeavour as far as possible to keep subscribers' lines right, and that affects all departments.

My last words are that everybody should endeavour to bring about co-ordination between all the different departments—all work together—and in working for the Company everybody should remember they are also working for themselves. It stands to reason that if a man does not do his best for the Company, he cannot expect the Company to do its best for him. A good many overlook that. They think because they have been in the service a certain number of years they should receive a certain remuneration, but if their services are not worth it, they cannot reasonably expect the Company to pay that remuneration. It is therefore incumbent upon everybody to do his best, and, to borrow some technical terms, we should see that our speaking is good and our ringing clear, that our motives are good and our batteries are not run down; if there are any disconnections between the various departments, let us get the disconnections cleared as quickly as possible. We hope the contacts will always be as close and friendly as possible, and finally, I hope it will be many years before any of us make earth.

RECRUITING PRIZES.

MR. S. A. HARDSTONE, Engineer-in-Chief's Department, has won the *Daily Mail* second prize of £50 for obtaining recruits for the Territorial Army in London.

PRACTICAL UTILITY OF A RESIDENCE TELEPHONE.

THE servants at the Vicarage, Otley, were alarmed recently by the conduct of an obstreperous tramp, who would not leave the grounds when requested. The police were telephoned for, and P.C. Kendall went there and found a tramp of no fixed abode, who gave the name of Dennis Moss, hiding in the shrubs in the grounds. He had twice that afternoon been begging at the Vicarage, and he told the policeman that he wanted to see the Vicar. He was taken to the police station.

NUNEATON FACTORY.—MANUFACTURE OF CEMENT BLOCKS.

By C. F. GANDERTON, *Cashier, Notts Factory.*

As most of the large districts have used cement blocks in connection with the construction of the underground systems, perhaps some details as to their manufacture will interest many readers of the JOURNAL.

In 1898 the Company opened at Nuneaton, a factory on a site which had formerly been a brick yard. It was most conveniently situated, being central for all districts, near to both railway and canal, and contained granite quarries, and as granite is the heaviest material used in the manufacture of these blocks (viz., 3 tons of granite to 1 ton of cement), a saving in carriage was effected on this heavy (yet not expensive) material.

The granite was obtained from an adjoining quarry, direct from the crushing machine, and was very small—some of it would pass a $\frac{1}{32}$nd mesh. It was also found necessary, in order to improve the blocks, that all dirt should be removed from this material, and to this end a washing machine was obtained. The sand which accumulated from the washing of the granite was found

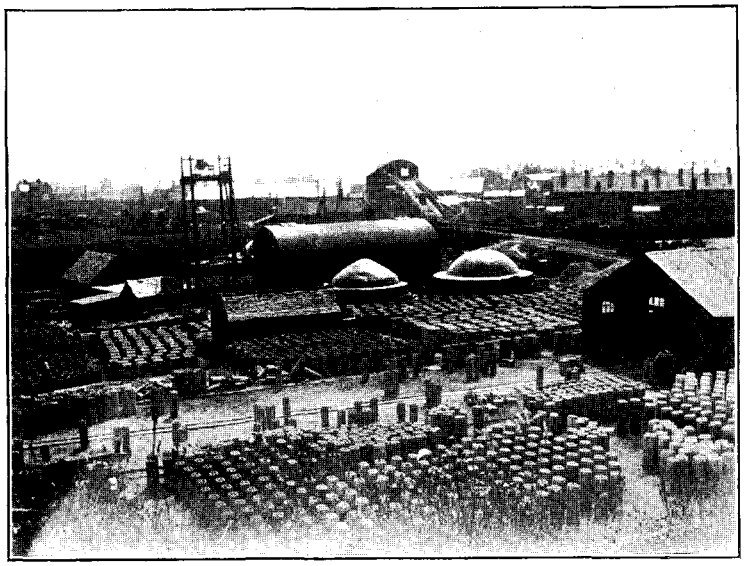


FIG. 1.

to be suitable for building purposes, and was sold to builders, thus reducing the cost of washing.

Cement, the most important material used in the manufacture, was received in 200-ton lots, and on arrival was tested as to strength and quality by the Engineer-in-Chief's Department. This was stocked in unused brick kilns (see domes on photo) which were most suitable for the storage of such material, as the walls were 3 feet to 4 feet thick, and afforded protection against damage by wet or damp, to which cement is so liable. I have seen bags of this material as hard as granite, when carried by canal, through having come into contact with water on the way; needless to say these were rejected.

Air slacking of the cement was another operation found necessary for improvement in the manufacture, this being a method of relaxing, which caused the cement and granite to combine better.

The blocks were made in moulds, the latter having to be very exact and uniform, as it was necessary for each block of the same number of holes to be the counterpart of the next block when laid. These moulds consisted of wooden sides with about $\frac{1}{8}$-inch steel lining, held together by long bolts, the holes or ducts being formed by steel tubes to the required number. These were withdrawn as soon as a block was made, thus leaving a smooth interior surface, which is necessary to avoid any abrasion when the cable is being drawn through.

In the making up of the block several bucketsful at a time of the mixture of granite and cement were put into the mould, and rammed with steel rammers, and so on until it became impossible to get any more in; it was left for a short time, when the bolts were

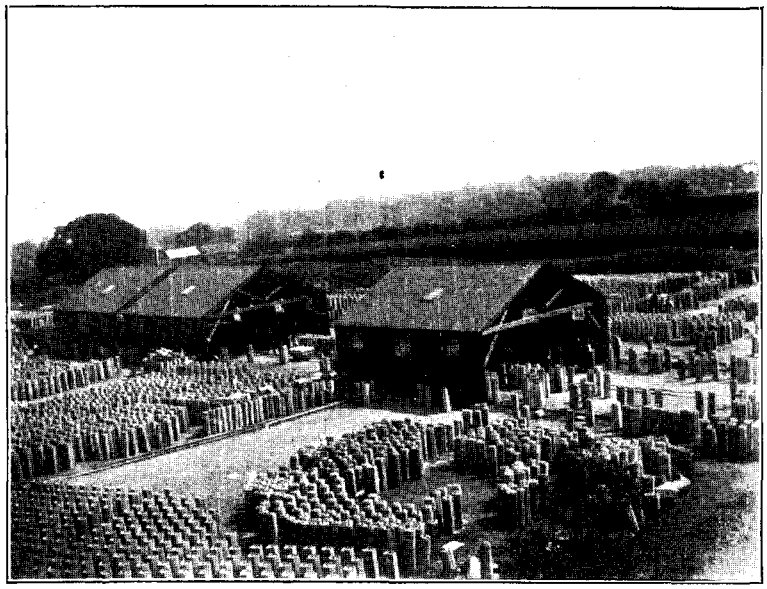


FIG. 2.

removed, and the block was left to stand exposed for at least three weeks, some for three months or more, according to their soundness. Afterwards they were tested by the Engineer-in-Chief's staff before being sent to the districts.

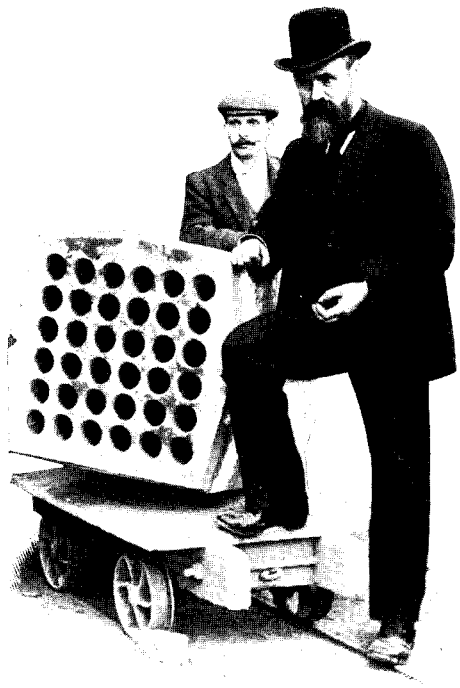


FIG. 3.

To expedite the output a telferage was erected (see Fig. 1). This consisted of two raised platforms, one about 12 feet and another about 60 feet, supported by large poles, with a number of steel cables running to various parts of the (3-acre) yard. The mixing of the material being done on the lower platform, it was raised to the higher one and despatched to the different gangs in

the yard, the empty buckets returning to the lower platform for refilling.

Four sections of movable sheds some 40 feet wide were also erected for the men to work under in case of inclement weather (see Fig. 2).

Bearers.—All sizes required bearers except the three-way. This size, however, from its formation does not require one. These bearers, like the blocks, are made in small moulds, and of the same material—granite and cement—and are used for a foundation in the trenches when laying the blocks.

(Fig. 1) shows a general view of the factory, with an adjoining quarry and its crushing machine.

THE EDUCATION OF SUBSCRIBERS.

BY H. C. TOWNSEND, *Assistant Exchange Manager, London Wall Exchange.*

TELEPHONE subscribers are beginning to appreciate the fact that their business and life's work are to a large extent dependent on the telephone service. They are often willing to admit this, and are gradually showing a desire to learn the correct way and the proper manner of using the telephone. Their unreasonableness and want of knowledge are becoming a matter of ancient history, and a new era of the telephone service is being entered upon, in which the helpfulness and co-operation of subscribers will be the leading features. The organisers of traffic are therefore endeavouring to establish a system of education for subscribers, by means of which the efficiency of the service shall reach that stage of perfection which at present only exists in the vivid imagination of the enthusiast.

Subscribers, as a rule, have very little knowledge of what is actually taking place during the establishment of connections which they have asked for. It is therefore often necessary for them to exercise a great deal of patience, but unfortunately the quantity and quality of this virtue is not always equal to the occasion. It is advisable to show them the working of the exchange, and explain the various methods in use, and the difficulties that have to be overcome.

The fact that any operator in the switchroom is able to call any subscriber should be carefully explained, together with the means by which an operator understands that the subscriber called for is engaged. An opportunity should be taken to impress upon them the various ways they are able to help the service, and forward their own interests, by diminishing the number of ineffective calls, which are due to the lines being engaged.

If there are not sufficient exchange lines the traffic becomes congested, and the lines are engaged so often that callers cease to make calls to them and business is transferred elsewhere.

Lines are held far too long at times while one of the parties connected goes in search of information. If this were avoided the number of ineffective calls would rapidly decrease.

In this atmosphere where subscribers' interests and improvements in the service are so prominent, a subscriber's elementary ideas of the simple switching arrangements and the good time operators have while on duty would rapidly change. In connection with the "number engaged" trouble an interesting incident occurred just recently. A subscriber made a complaint that the operator continually replied that the number was engaged, but he found out afterwards that the telephone had not been used. He was particularly excited and pleased to think that he had laid an excellent trap for the operator. He said that a friend and himself made test calls between two telephones, and at exactly the same time, they were each told by the operators that the number was engaged. When the fact was explained to him that both telephone lines were engaged, because both he and his friend were speaking to their own operators, his tone quickly changed, and his exultation disappeared. He said very little more on the subject, but evidently thought the more, and probably sought a little comfort from the well-known maxim "there are more things in heaven and earth than are dreamt of in our philosophy."

In most cases the operator is the medium through whom the subscriber receives his first and elementary instruction. By repeating the exchange and number correctly he is reminded that they are not asked for properly. If an application is made by giving in the name and address of the distant subscriber, he is politely referred to the telephone directory. If he speaks too loudly the operator explains that she is unable to understand him, and asks him to speak a little quieter.

The clerk-in-charge then takes his education in hand, and is the second medium through whom he obtains his more advanced instruction. Considerable tact is necessary in this part of his education. It is necessary to explain that the name of the calling subscriber should be obtained before the conversation is commenced in order that if by any chance an interruption takes place and the lines become disconnected, the connection can be speedily established again. Numbers are often given indistinctly, and the possibilities of wrong numbers and the consequent delay have to be placed before him. The receiver is put on the rest before the conversation is completed, while one of the parties is making enquiries, and thus gives a signal to the exchange. In these and various other ways the subscriber can cause a drag on the service, but it is found that a word in season invariably has the desired effect.

The "permanent glow" trouble is one which commands very great attention, and it is very necessary that subscribers should understand the difficulties which arise through his leaving the receiver off the rest, and thus preventing his bell from being rung. It is undoubtedly the best plan to tell callers that his line is out of order, so that when he hears of this, he at once makes an investigation, with the result that some changes quickly take place to provide against the inconvenience to his customers. The exchange manager deals with the worst cases, and takes in hand the complaints of all unreasonable and unsatisfiable subscribers. Genuine complaints also come under his notice, and with the aid of his large experience he is generally able to smooth over the most complicated affairs.

A great deal of interest has been centred on the "cheerful voice," and undoubtedly this voice is a most essential asset to good operating. Not only is it necessary for the operator to possess a cheerful voice, but also the subscriber, if the service is to reach anything like a perfect stage. One person's character is often changed considerably by the influence of another, and it is therefore very necessary for an operator to possess a cheerful voice and a pleasant manner of speaking, in order that the atmosphere of the telephone world may become clearer and the confidence of the subscriber be obtained.

In conclusion it may be added that the magic word confidence is the first and last word in operating, and the secret of a good service. It is necessary that a confidence be built up between the operator and the subscriber, a confidence that will overcome misunderstanding and the force of circumstances, in order that the many difficulties and inexplicable incidents that occur may not be judged too harshly. It is true that the operator receives the benefit of a subscribers' business worries and bad temper, but it is at these times that the better nature should triumph. When everything is working smoothly there is little need to exert one's utmost powers to help anyone, and operators generally find that if only they can stem the tide of their indignation when unfavourable circumstances arise, and do their level best to please a subscriber, their good intentions are greatly appreciated. With the building up of these confidences the telephone service will rapidly improve, and in the not far distant future the operator and subscriber will work in almost perfect harmony.

THE *Chicago Operating Bulletin* gives the following definitions of familiar objects in the switchroom. We doubt if they will be very illuminating to the operator seeking after knowledge:—

Cord.—128 cubic feet of wood.
Plug.—A broken-down horse.
Switch.—Part of a lady's coiffure.
Pilot.—A steamboat officer.
Lamp.—A means of illumination.
Ticket.—A card of admission.
Key.—A friend of the midnight rambler.
Opal.—A precious stone.
Receiver.—A bankrupt's substitute.
Ring.—An object of interest to girls.
Trunk.—A travelling companion.
Relay.—An essential in the race.
Jack.—A versatile man of all trades.

CONTRACT GETTING.

BY ARTHUR W. BOWKER, *Contract Officer, Sheffield.*

A FEW ideas which I have found successful in securing new business for the Company may possibly prove acceptable to some of my brother contract officers.

Unless a man knows and feels convinced in his own mind that the thing he is advocating is a sound and good paying investment he can hardly put it before his client in a decided and convincing way. As in the case of some preachers and public speakers whom we know, their dull and uninteresting discourses makes one inclined for sleep, whilst an enthusiastic and earnest man compels attention, convinces and grips from the first word to the last.

Enthusiasm and conviction, and putting your facts before your prospective client in a tactful, persevering and convincing way are, I think, the chief points to be observed in securing and keeping contracts for our Company.

When a man is first approached with regard to the telephone he in most cases will look upon it in the light of a luxury and a thing he can do without. He will probably talk as if his £6 or more would be spent without any return. This is not so.

When soliciting for new business I always press home to a business man as my main argument the advertising value of the telephone and the paying benefits of the inward calls. Ask your man whether he advertises; invariably he will in one form or another. If so it is certain that he can hardly get a small advertisement in a newspaper or that he can circularise systematically for less than £6 per year.

Then you can point out that the advertising value of the telephone is much greater than this, as, in addition to giving him a universal advertisement and adding prestige to his business, it actually brings him the orders and enquiries he wants, for it brings him into immediate touch with practically the whole business and residential people in the district who are worth anything at all from a business point of view. Business men, you can impress upon him, have no time to waste, and necessarily must give orders and make enquiries by telephone wherever possible.

The number of orders which the residential class will telephone when they would not dream of going to the trouble of a personal call is enormous. Orders and enquiries of all descriptions and for all businesses and professions go to those who have the telephone. Even the smaller business cannot benefit to a less extent than, say, £12 per year, and in the case of a larger place the benefit will proportionately increase.

Put it in this way: the telephone will cost, say, £6 per year. In return there is at once more than £6 in advertising value, and a close acquaintance with your district will enable you to point out the important customers in communication with whom he may at once be placed. The time saved to a business man and his assistants by the presence of the telephone, will, in the course of twelve months, be worth far more than the £6, and the direct increase of trade by means of the inward calls placed on the top of this can often clinch your argument.

In the case of residences the previous arguments and ideas can be echoed to meet the circumstances surrounding your prospective client. A business man must be in instant touch with his business at all times. When he has left the office or shop at night, or before his arrival in the morning, important points crop up. Delays mean the loss of valuable business, which is money. The telephone will make delays impossible. Should illness keep him at home he can still direct his business over the wire as though he were at the office or shop.

To the residential class, as apart from business purposes, the question of convenience must strongly appeal. The time and trouble saved in shopping, the immediate communication with other people of social standing, everything that is an argument for convenience is an argument for the telephone.

In conclusion. Do not say you *think* the telephone will pay your prospective client. Tell him that you *are certain* it will, and you can say this with every confidence as every man in the Contract Department knows (or ought to) that the telephone is the best paying asset any business man can have.

"*I know* it will pay you, Mr. Jones," is the motto. If he says that it will not pay him you can then cite cases (as I have) of other existing subscribers who have told you the same thing at first, but who, having been persuaded to try it, are now enthusiastic subscribers and have thanked you for connecting them. Confidence means everything. A lukewarm advocate means poor business.

THE NATIONAL TELEPHONE COMPANY'S STAMPS.

WITH reference to the last instalment of the article on "Communication" which recently appeared in these columns, a correspondent sends us the following information, obtained from an official source:—

The stamps were first issued in December, 1884, and they remained in circulation until the end of 1891, when Mr. Anns says "they were discontinued by request of the Postmaster-General, to prevent the possibility of their being used by the public as postage stamps. Whilst in circulation they were sold by the Company to their subscribers and the public for the purpose of affixing to forms kept at the Company's various call offices when requiring to send a message over the Company's telephone lines." The different stamps corresponded with certain fixed rates of the Company, which were based upon the distance intervening between the places people communicated with. The stamps were supplied by Messrs. Maclure, Macdonald & Co., of Glasgow, and they were surface-printed, the sheets containing twelve stamps each, in four horizontal rows of three. The numbers furnished were as follows:—122,196, 1*d.*; 124,800, 3*d.*; 22,800, 4*d.*; 93,840, 6*d.*; and 61,032, 1*s.* The one penny is printed upon thin greyish wove unwatermarked paper, the fourpence on thin bluish, and the other three values on thin yellowish paper, in other respects similar to that of the one penny. All the five values are machine perforated 12. Designs: A three-quarter face portrait looking to right, on background of solid colour, of Colonel Robert Raynsford Jackson, who was chairman of the board of directors at the time the stamps were issued, is the same for all the values. The one penny has the portrait in an upright oval, which is enclosed within a rectangle, the corners of which contain conventional ornaments. Outside the four sides of the rectangle is the name of the Company in coloured block capitals, "NATIONAL" to left (reading upwards), "TELEPHONE" at top, "COMPANY" to right (reading downwards), and "LIMITED" at the bottom. The four corners of the stamp contain the value "1*d.*" within a circle, and a plain outer line of colour completes the design. The portrait on the threepence is enclosed within an octagon. The name of the Company is disposed as in the one penny, and the corners of the stamp contain the value "3*d.*" placed slanting, and enclosed within a block-shaped ornament, pointed at one end, which fits into the corners of the stamp, and straight at the opposite end. The fourpence has the portrait in an oval, which is impinged upon at either side by a much smaller one, containing the value "4*d.*" Plain labels follow the shape of the central oval, above and below, the upper inscribed "NATIONAL," and the lower "TELEPHONE CO. LD.," in small coloured block capitals. The corners of the stamp contain conventional ornaments, and a plain outer line of colour completes the design. The sixpence has the portrait within an oval, pointed at the top and bottom. Surrounding the oval is a plain band touching the four sides of the stamp, inscribed "NATIONAL TELEPHONE COMPANY, LIMITED," in coloured block capitals, with a period between the second and third words, and a star at the end. The corners of the stamp contain square blocks of colour, with the value "6*d.*" The one shilling has the portrait within an upright oval, surrounded by a plain band touching the four sides of the stamp. The band is inscribed "NATIONAL TELEPHONE CO. LTD" in the upper curve, and "ONE SHILLING" in the lower, all in coloured block capitals. A star-like ornament separates the two inscriptions at either side. The corners of the stamp contain ornaments, and a single outer line of colour completes the design. The stamps are upright rectangular in shape, and measure 18 × 22 mm. The colours are:

1*d.*, black.	6*d.*, bronze-green.
3*d.*, pale red.	1*s.*, brown.
4*d.*, ultramarine.	

For many years past several collectors of postage stamps have included telegraph issues in their albums, and as the telephone system is so closely allied to the latter branch of the Post Office, I do not see that collectors can consistently exclude telephone stamps from their attention. Besides the set described above the only other telephone stamps that are known to me are those used in France. I have seen two distinct sets of these stamps, which differ in the inscription. The first was, I believe, issued by the French Government early in the year 1885, and consists of three values—25 centimes, blue on yellow; 50 c., red on pale lilac-pink; and 1 franc, red on pale blue (the latter value only appearing in 1887). Of the second set I have seen 50 centimes, red on lilac-pink; 1 franc, red on blue; and 3 f., black on green. The stamp on all the values of both sets is the same type as that on the telegraph cards and envelopes, having the word "TELEGRAPHE" at the bottom.

LIBERTY WITHOUT LICENSE.

"FANNY has given notice."

"Why?"

"She says you spoke in a brutal manner to her on the telephone yesterday."

"Yesterday? I thought I was speaking to you."—*Pittsburg News.*

TELEPHONE WOMEN.

XXXIX.—KATHERINE PRING.

MISS PRING entered the telephone service in August, 1896, at the Avenue Exchange, and has here spent the whole of her time as an Operator, with the exception of a transfer for six months in October, 1899, to Edinburgh, in order to obtain a complete change of air, where she resided with her grandmother, being of Scottish descent on the maternal side. In Edinburgh she was placed at George Street Exchange, under Miss Johnstone, and has vivid recollections of the impression she then received of the good service given with the very inadequate number of junctions then existing.

On July 10, 1903, Miss Pring was promoted to be Supervisor at the Metropolitan Operating School, then a temporary and comparatively poorly equipped institution at Telephone House, having been hurriedly removed there after the fire at London Wall.

On March 11, 1904, she was transferred as Supervisor to London Wall. Further promotion as Senior Supervisor at East Exchange followed on Nov. 10, 1906, and on May 22 last she was appointed Clerk-in-Charge at Sydenham Exchange, which has been constructed in the large building known as the Public Hall, previously licensed for theatrical performances, the stage of which now forms the power and testrooms, and the green rooms are accupied by the local Contract and Maintenance Departments.

KATHERINE PRING.

Miss Pring confesses to a very keen enjoyment of the pleasures of life, in the shape of theatres, dances, reading, and all outside sport, and in her spare hours in the summer has been seen instructing her operators in tennis on the court adjoining the exchange. As regards the more serious side of life, outside the immediate sphere of her duties, Miss Pring is an ardent suffragist, with somewhat militant tendencies. She has not yet suffered "Holloway" in the cause, but has gone so far as to carry a banner in a procession from Trafalgar Square to Hyde Park, as an expression of her sympathy. These views have certainly not affected Miss Pring's excellent work as a Clerk-in-Charge, nor her popularity with the staff.

XL.—ANNIE WRIGHT.

MISS ANNIE WRIGHT first became acquainted with the telephone industry in the year 1892 at Manchester, when she commenced as an Operator in the employ of the Mutual Telephone Company, which Company, it will be remembered, ran for some little time in opposition to the National Telephone Company.

ANNIE WRIGHT.

When the former was absorbed by the latter, Miss Wright was transferred along with the plant and became an Operator at the Company's Central Exchange.

At that time the Mutual Company had their exchange in a portion of the room which is at present occupied by the National Company's Central Exchange, and the Company's then exchange was in the premises of the Manchester Royal Exchange Company. The boards were of the upright type with hand-restored indicators. Sometime afterwards the present Central Exchange switchboards were installed at 102, Portland Street on the call-wire system and flat multiple, this board being subsequently converted to the present call-key ring-through system.

Miss Wright has thus had experience in three different systems, viz., call-wire, magneto, and call-key ring-through working, and has consequently seen much of the difficulties arising from the change of methods of working, all of which has been valuable experience for her in her present position. It says much for Miss Wright that she had only been in the service five years when she was promoted to the position of Supervisor, which position she successfully held until her further promotion in May, 1907, to the position of Clerk-in-Charge of the Manchester Central Exchange, which is the largest exchange in the provinces, with a staff of some 200 operators and supervisors under her control.

Miss Wright is a believer in strict discipline, but at the same time she is always ready to enter into the recreations of her staff with enthusiasm, taking an active interest in the various clubs and social entertainments which are inseparable from a large staff of operators. She has been a prominent member of the staff social committees, is a playing member of the operators' hockey club, and a strong supporter of the Company's athletic society. Her principal hobby, however, is chip carving, and she has turned out some beautiful specimens of this work, gaining several first prizes in her class, and stimulating other members of the staff to take up this useful form of winter evening recreation by the exhibition of the many examples of her success.

CARDINAL POINTS OF OPERATING.

BY S. J. PHARO, *Portsmouth.*

IN dealing with this important branch of telephone work I am afraid that so much has recently been written on the subject that it will be next to impossible for me to touch on any point which has not already been dealt with by more experienced servants of the Company than myself, but I have noticed that most of the papers and articles on operating have nearly always referred to exchanges in large districts having from 2,000 to 7,000 lines, and in the present article I propose dealing with the medium-sized provincial exchange.

When the telephone first began to be something more than a laboratory experiment it soon became apparent that some arrangement would be necessary to ensure the speedy connection of one subscriber to another, and some kind of switchboard was constructed for this purpose. Before cords were used for this purpose the connection was made by a series of vertical and parallel bars which were connected by small brass pegs, and although this method was exceedingly slow, still it was the only form known and worked very well for a time. As subscribers increased on the exchange the arrangement began to get unwieldy, and the main function of the telephone, which was to get people to talk to each other, was very often frustrated by the subscriber being put in contact with people that he did not want to talk to. Several other types of board were tried; then telephone engineers began to devise multiple switchboards; and when I remember the first switchboard I saw working (an old Edison peg board) and compare that with the present day's up-to-date common battery equipment, I feel certain that in no industry has been made anything like the progress made in telephony. What ten years ago was brought out as brand new and was going to revolutionise telephony is to-day on the scrap heap. In no other department has so much improvement been made as in the switchroom, both in equipment and in the method of using it. The present-day rapid operating could not have been possible except for the splendid outfit installed in some of our exchanges at the present time. Still, equipment is not everything, and it is possible, if the chief points of operating are carefully considered, to give not only a passable service, but a good service may be given and maintained with the ordinary magneto hand-restoring indicator board with twelve pairs of cords, ordinary cam levers with common ringing keys, one button for each cord (requiring an average pressure of 8 lbs. to actuate them) and ordinary ring-off indicators. I am quoting this in detail because it is with such a switchboard that I have been working for the last four years, and seeing that we have held our own with some of the up-to-date common battery exchanges I adhere to my previous statement that equipment is not everything. It has been said that there is no comparison between a provincial exchange and a busy London one where the average calls per line are fifteen per day as against eight or nine calls per line per day in the provinces, but my answer to that is that the operator's load is the same in both cases, and that where in the town exchange the lines per operator amount to 80, in the provinces an operator will often be given 130 subscribers to attend to, and all outgoing junctions are ringing ones. She has therefore none of the advantages of the call wire junctions with their experienced and highly trained operator at the other end to get her 80 per cent. of calls through, but has often the sub-exchange caretaker, whose operating is not all that is to be desired, to receive her rings and deal with, say, 20 per cent. of her calls, the other 80 per cent. being local, each of which she has to work hard to get, as the column "Time to get called subscriber" in monthly service test shows.

Now as *to the chief points of good operating.* It is a difficult matter to decide which of the following should take precedence in the point of importance:—

Speedy answering;
Quick connection;
Accuracy of connection; or
Rapid disconnection.

The above four I make the principal points and the following are nearly as important:—

Courteous address, distinct repetition, watching supervisory signal, absence of cut-off or interruption during conversation.

Now let us take the *Speedy Answering.*—When a subscriber goes to a telephone he invariably does so because he wants to speak to someone, and, if a business man, he often leaves it to the last minute he has to spare before proceeding with his business. He has often reached the point in his daily routine where he is at a standstill until he gets an answer from his correspondent. He is often in a hurry and it is at such times that each second waited seems the length of three. Have you ever stood at an instrument with your watch in hand and counted fifteen seconds or even half a minute; it seems an enormous time, quite three or four times longer than it actually is. It seems longer still if you are in a room alone, and still longer if you have a common battery instrument (which of course applies to party line circuits), because with a common battery instrument there is nothing to do except just take the receiver off the rest and wait for an answer from the exchange, but with the magneto there is something to do, and the subscriber can vent his pent-up energy in ringing, but with the common battery there is no such outlet. A subscriber once told me that his common battery instrument was the most inanimate brute he ever came across when he could not get an answer from the exchange. It's a case of something attempted, nothing done, but the receiver taken off, and if you do not get an answer within three or four seconds you begin to fret and fume and imagine that something has gone wrong and there is very little else to do except to work the switch hook up and down, which requires such very little effort that it is very little use indeed. I have been told repeatedly that the subscriber does not know whether he has signalled the exchange or not, but with a magneto instrument a subscriber could tell if his line were disconnected by the ring, or, rather, by the turn of his instrument. I corrected myself when I said by the ring, but that was the case as well, for before the cut-outs were introduced in the bell circuit the subscriber rang his own bell when he rang the exchange and so could tell whether he rang the exchange or not by his own bell, and when the cut-outs were introduced he still got a drag on his armature if the line were short, and if disconnected the armature ran very easily.

All this is changed with the common battery and I have quoted this to accentuate the importance of the speedy answer; and if a subscriber rings up and says: "I have been waiting with this blank instrument to my ear for ten minutes," sympathise with him, for he thinks what he says is true, and it is altogether wrong to contradict him, but you might be able to convince him later on that he has not waited ten minutes.

If team work is properly developed (and here I should explain that team work means that the operator instead of only taking those numbers which fall immediately in front of her, takes any number that is within reach of her on either side), where there is a rush, delays are brought down considerably, because calls do not come with any systematic regularity, but a rush of ten might occur on one position and yet the operator on either side of that position might be doing nothing. Each operator in the team considers any indicator-signal as much her work as if it fell immediately in front of her, and one supervisor placed over this team can soon work her operators up to see the importance of this. It will be found that this team will deal with half as many calls again as if each operator worked individually. If where eight to ten indicators fall down almost at once they are taken, say, by the operator facing that position and the operators on either side, they should easily be disposed of in an average of three seconds.

The first three calls can be answered within two seconds, and

if it takes five seconds to answer the third in each case it will be exceptional. While the operator is answering the second call she can be ringing the called subscriber for the first, and while answering the third call she can be ringing the subscriber asked for by the second call, and this is where the value of well-developed team work comes in. In the old time adjacent operators would no more have thought of answering any subscriber not coming on the position immediately in front of her than (except in the case of friends sitting next to each other) she would of offering to take the whole of the late duty of the exchange for a month. I have often in the old days in a big London exchange heard the remark: "She expected me to take half her subscribers and my own too." I think now that operator's can see that this pulling together keeps down the complaints and makes subscribers more satisfied.

When an operator gets a slack time, as she will even on the busiest board, she should always have an answering cord in hand ready to plug in, and she should never be allowed to assist inspectors at subscribers' testing their instruments. It should be remembered that operators are operators and not assistant inspectors. Any bell adjustments or test rings should be done with the test room, and operators left free to do legitimate operating and have their minds clear for their own work. Operating is a tedious and worrying occupation and on a busy board an operator will get all the worry she can put up with from her subscribers without having any from the Company's servants. In most exchanges there is an enquiry clerk, supervisors and clerk-in-charge; let them thoroughly understand their work and a good supervisor will soon see where she can assist an operator. There should be no discussions allowed between operators and subscribers, no disputing about names or arguing about pennies; all this should be taken by the clerk-in-charge, supervisors and enquiry clerk.

All these things can be stamped out by judicious supervision and making most of that valuable addition to the exchange equipment, namely, the observation table, which has done so much to rectify the irregularities of operators and the errors of subscribers.

When the observation sheets are carefully gone through in the exchange many points will come to the notice of the exchange manager which will put him on his guard against a similar contingency in the future. Anything foreign to actual operating, that is answering, obtaining number and disconnecting should be done away with immediately it is detected amongst operators, for all these things act as a drag on the operator who is trying to get an average of three seconds for answering. The summary, then, of this item is "Let operators do only legitimate operating, take no complaints, always have cords ready, thoroughly understand team work, and signal supervisor for anything outside the ordinary routine."

Quick Connection.—After speedy answering this is I consider the most important, and I might couple with it *accuracy of connection.* Nothing is more exasperating to a subscriber than when after waiting some time to get his number he is connected to a person he does not want. Where flat and message rates are concerned, this is not always a difficult matter, because the subscriber required is the only one on the line, but in party line ringing, even with the latest pattern ringing apparatus there is a possibility of ringing one ring too many, or one ring short, which means that it has all to be gone through again, besides the annoyance caused to the calling subscriber and also that caused to the subscriber called in error, so that accuracy and speed of connection plays an important part in the process of getting a call through. I cannot emphasise too strongly the importance of repeating the number correctly and audibly in such a manner that the subscriber can hear (and here let me point out the necessity for a cheerful answer as well as a correct one—I won't enlarge on this point, which has been so ably dealt with in an article in the JOURNAL), and not after the following style: "Nobby two one Y"; and operators should bear in mind that a quick answer does not mean that the words are to be spoken as quickly as possible, but that the time between receiving subscriber's calling signal and the time of going on the line should be reduced to a minimum. Once on the line let the answer be as plain as possible: "Number, please, 209 or 201Y."

It is also necessary to make certain that the operators' instruments are in perfect order, for it is at this period of the operation that the irritating irregularity of asking a second time for a number creeps in. This may be due to subscriber's transmission or operator's receiver being out of order. I have noticed also at this point that the fate of the call often depends on the way the operator repeats the number. If she gabbles it over, she remembers it in a slipshod, uncertain manner, but if it is repeated deliberately and distinctly it is remembered more easily, and is less liable to go astray. I have often heard subscribers remark, when a girl has asked the second time for a number, "How inattentive they are at that exchange," even after getting 50 or 60 calls through without trouble. When an operator is seen at the switchboard continually adjusting her receiver and shifting the position of it, the sooner that receiver is changed the better, for before long it will be the cause of a bad call. Either a call will go astray through her not hearing correctly, or some important subscriber rung up in mistake. The exchange inspector should be put on to headgear immediately the instrument is changed. Above all things an operator should be comfortable at the switchboard. I have known an operator who usually was a good operator and reliable, make three or four mistakes in one morning, simply because the chair she was sitting on was not the right height and the kicking board had been altered the previous night. All apparatus on the position, plugs, cords and keys should be "O.K.," number plates and number stiles should be in permanently before business is commenced for the day. Instruments should of course be adjusted before entering the switchroom.

Summing up then the second and third points we have, correct and plain repeating, cheerful answer, and certainty of number required.

Rapid Disconnection.—This is almost as important in a busy multiple board as the connection because if, when a subscriber has finished his conversation, he is still left connected, he will lose business and his correspondent's line will also be reported "engaged." The value of operator's position also goes down because she has fewer cords to work with. All these delays in disconnection cause the percentage of lost calls to go up. I notice in this month's report of the service that from 20 to 30 per cent. of lost calls are recorded. Now take an exchange having an average of 12,000 calls per day, 30 per cent. means 3,600 lost calls per day. We talk very glibly of 25 and 30 per cent., but when we work the figures out, it seems an enormous total; therefore it is most important that the clearing should be as rapid as the answering. There is often a difficulty if subscribers on a magneto exchange forget to ring off, but that can be cured by good supervision, and if a subscriber is known to be a chronic offender in this respect, practice should be made of ringing him up after he has finished and left the instrument, and enquiring if he has finished. Apologise for troubling him and say you were afraid he forgot to ring off, and if he has a spark of humour in him, he will see through it in a short time and will trouble you no more, but you must watch him and not give him a chance to miss. He will be cured in a few days, and will see that it is better to ring off when he has finished than to be brought back to the instrument a few minutes afterwards. It is no use to sit still and say "Number so-and-so won't ring off," and let it stay at that. The subscriber must be supervised very closely, and if the above treament is not successful, go and see him personally, and point out that he has probably lost an order or two through his line not having been cleared promptly. Don't lose sight of the fact that all ineffective calls are detrimental to a good service, and there is no greater stumbling block in this respect than delays in clearing; a good service does not only mean a quick answer, but the certainty of the subscriber getting what he wants, and anything over a five seconds' clear is building up the total of lost calls and defeating the end at which we are aiming, namely, to get people to talk to each other, and make the telephone a reliable part of a business man's equipment.

The summary of rapid disconnection is covered in a very few words. Let operators have decided clearing signals, not faulty clears on lamps, or ring-off indicators which drop with the slightest movement of the board. If an operator is to clear or break down the connection on receiving the signal, then that signal must be absolutely reliable whether it be lamp or ring-off indicator. If an operator cannot rely on these things, the only course open is to tap the line, and this is going back to prehistoric days of telephony, and nothing like a four-second service can be given; yet

a very short time ago I was in a busy up-to-date exchange and heard operators saying "Have you finished?"

The answering and clearing is most important from another point of view, namely, the revenue-earning value of the line. When it is a limited line, the calls can be put through quicker if the line is answered and cleared promptly, and as only effective calls are charged for, it naturally follows that all work connected with lost calls is waste; and when we consider the time it takes to handle 3,600 calls and see that all that time is useless and is not returning any revenue, I think it brings the matter more clearly and more forcibly to our notice and urges us to try our utmost to keep down the "total operation" figure to six seconds, and anything that is the slightest drag on operating should be cleared out immediately. I must here say a word about faults and their duration in exchanges. Every faulty cord or lamp out of order, every indicator or key should be "O.K." with the commencement of the morning's work, and if a fault occurs in the part of the board that would obstruct the operator if the inspector dealt with it at once, it would be better in the case of a bad key or cord to throw it out of use for the time being than to have the inspector working at the board in a busy time, and while all faults should be cleared with the least possible delay, it would be better still if they were anticipated by systematic testing. Let the operators be given a pad in the slack time and test all cords, lamps and keys. The pads can then be collected by supervisors, summarised and dealt with by night or late inspector. A regular overhaul in the apparatus room and fuse board equipment will also save faults. Fuses should be systematically examined, for such examination often brings to light a loose terminal which would heat up under full load (which is, of course, the busiest hour of the morning and a time at which you can do without any fault at all), and I might here point out that if a fuse goes it might mean an operator's transmitter fuse, or a block of calling signals, or a set of clearing signals, any of which is disastrous. Only those who have been in a busy exchange during the peak of the load and have seen the havoc a restoring fuse or operator's circuit fuse can cause can realise what it means. I was once told by an official of the Company that there was a special heaven for the exchange managers; but that, of course, would be after he is dead, and it is at such times as I described above that he wants some special help here on earth. When the minutes go by and the inspector does not happen to get on quickly I have always noticed that at such times a kicking subscriber whom you are nursing generally gets upset or a call gets astray from a subscriber that you have been trying to pacify for months. You have probably got him round to believe you can do something for him sometimes, when this trouble occurs, and then you have to begin all over again. Not only so, but it is rather disheartening for the operators when they have been trying to get three seconds' average when this comes and spoils the test for the day. Of course the observation clerk cannot be bothered with such trifles as faults; he records what service subscribers get, not what they would get if all were "O.K."; so that prompt attention to faults is good for operating, but anticipation of them is better. And just a word to foremen and linesmen while I am on this subject. When they are going to cut a wire in a bay for the purpose of drawing in a new line, they should kindly tap to see if the subscriber is in the middle of a trunk call, or else the following might happen:—The subscriber complains that he is cut off by the exchange while through to trunk. The connection has not been interfered with in the exchange at all. On enquiry of the Post Office the operator has heard conversation established, and consequently there is no redress for the subscriber. We know nothing of the linesman having cut him off, because probably within a quarter of an hour he is joined up again, and there is no trace of his disconnection, and this is the most unsatisfactory part of it all, and causes the subscriber to look with suspicion on the telephone.

Operator's Duties.—Something was said in the early part of this paper as to the necessity of operators being comfortable at the switchboard. It is also quite as essential for them to be contented and comfortable with their duties, and the proper method of arranging these duties is so that each senior operator and each junior operator gets an equal proportion of early and late duties. It has always been my custom to make the duties out on a sheet and post them in a prominent position, so that each operator at the end of the week can see what duty she is drawn for the coming week. Where the wheel is in use this is an automatic arrangement that works the duties very well. In conclusion, I should say that operating efficiency and economy depends entirely on supervision. You can do more operating and better work with 30 well-trained operators than with 60 who have been left to their own devices without the occasional half-hour listening to their work and pointing out where they are wrong. Above all insist on operators working quietly. Nothing is more unbusinesslike than operators shouting at the top of their voices, and they will soon get into the habit if not checked.

Instruments are much more efficient if spoken into quietly, and any that require more than this should be handed over to the Electrical Department. Test them personally when they are returned, and satisfy yourself that they are "O.K.," and your hand will be strengthened in dealing with operators on the question of working quietly.

REVIEW.

How Telegraphs and Telephones Work. (Charles R. Gibson. Seeley & Company. Five illustrations and ten diagrams. 156 pages. 1s. 6d. nett)—This is a well-written and interesting book, which, in non-technical language, explains the main principles on which the working of the telegraph and telephone are based. As an introduction to the subjects one could hardly wish for a clearer exposition, as the analogies from common objects, which are very liberally interspersed, should enable the reader to get a very clear grasp of the subject. In the single chapter of fifteen pages devoted to telephony proper it can hardly be expected that much in the way of detail can be explained, so that only the merest outlines of the working of telephone exchanges, etc., are given, and these are not the latest central energy up-to-date exchanges. Curiously enough, too, they have had to go all the way to Shanghai, China, to get an illustration of a switchroom. Specially interesting chapters are devoted to "Signalling Without Wires" and to "Wireless Telephony."

There are several small matters which should be corrected, *e.g.*, on page 27 it is stated that "the electric pressure at which any primary cell delivers its current is always between one and one and a half volts." This can hardly be correct, even allowing for internal resistance—with, say, Grove's, Bunsen's or Fuller's cells which will be above, and with the Daniell which will be below, the figures given. It appears rash to state, as on page 51, that telegraph messages are now being sent "as quickly as can ever be possible." On page 102 the statement that "every telephone current is intensified *before* it leaves the transmitter by passing through an induction coil" is open to question. On the same page the writer mixes up induction coils for intensifying and inductance coils for loading.

ANTRIM JUNIOR SHIELD (FOOTBALL).

NATIONAL TELEPHONE, Belfast, beat Milltown in the final tie. A local football paper singles out Reid (the goalkeeper), Morrison and Saye (backs), Dunlop (half-back) and McDonald, McBratney and Burgess (forwards). An enthusiastic correspondent states that J. F. McDonald, who scored the goal, is an efficient instrument inspector, an efficient technical student, and an efficient footballer. The shield will be placed in the district manager's office at Belfast.

NATIONAL TELEPHONE STAFF BENEVOLENT SOCIETY, LONDON.

DURING March grants were made as follows:—

Engineers' Department	(4)	.. ..	£7 6 0
Construction ,,	(1)	.. ..	1 10 0
Maintenance ,,	(3)	.. ..	3 0 0
Traffic ,,	(4)	.. ..	8 1 6
Workshops ,,	(2)	.. ..	5 0 0
			£24 17 6

Donations to the amount of £12 18s. and subscriptions to the amount of £6 4s. 4d. have been received.

Number of members at March 31, 2,772.

Total value of grants made since the society started, £505 12s. 11d.

"FACTS AND FANCIES."*

BY ELINOR MARY JONES, *Operating School Teacher, Liverpool.*

IT is not my intention to deal at length with any particular subject, but just to touch upon one or two that may prove of help and perhaps of interest.

The good discipline or order of an exchange depends largely upon the observance of small rules, more perhaps than that of the more prominent ones.

The quiet orderly entries and exits of those coming on and leaving duty, the correct manner of relieving operators at the switchboard, the cultivating of an easy upright position when at the switchboard, are of the greatest importance, although to some they may seem only small things.

"Keep your heads in front of you" was rather quaintly put by a new operator, meaning by that remark that she understood that operators must not be continually turning round to see what is going on in the switchroom. Attending to calls is an operator's chief concern, and to do this properly, her mind must be on her work, and she must not allow her attention to be drawn away.

Speaking of an "easy upright" position, I mean the happy medium between a lounging attitude and a stiff manner of sitting. The first is likely to produce a feeling of irritability and disinclination for work, and the second has a tendency to increase nervousness.

Train yourselves to be watchful and alert, composed and quiet, and you will find out how much easier your work will become.

There is never any excuse for rudeness or abruptness in dealing with a subscriber, and it should always be remembered that the point "politeness," which is equal in importance to the other points, should be strictly adhered to. It is unfortunately not every one who is naturally gifted with a pleasant voice and courteous manner, but surely they are well worth cultivating, as their possession is of such value. You do not cast them off when the day's work is done, but they follow you among your friends, and in your home circle and make you more liked and loved, and are more to be commended than good looks. And then again, not only has each operator her own "honour," if I may call it so, to uphold, but that of *all* the operators, because in nearly all cases a subscriber takes his impression of operators in general from the one with whom he mostly comes in contact.

I think it is such a pity to hear anyone tell a subscriber to "Speak up, I can't hear you," in anything but a nice tone. The tone of the office in general is lowered; and it is such a pity, because the majority of our girls are courteous and even tempered.

In our most trying times and most difficult moments it would be well if we could be like the immortal "Mark Tapley" whose sole ambition was to be "jolly" under all circumstances, but he liked best the circumstances where it was most difficult to be jolly so that there would be some credit in it when he was.

There is a tendency sometimes to cultivate a very untidy way of working and carelessness in the handling of the cords, etc. The proper method of treating apparatus is a very important item, and at the same time I would warn all against getting into a slovenly way of working.

These things are so important and each one who is guilty of any faulty ways of working knows what she should do, but unfortunately does not recognise the importance of applying what she knows to be right to the practical working, either through indifference or disinclination to take the trouble to overcome difficulties, or sheer inability. One may sometimes know exactly how a song should be sung, but at the same time be unable to sing it.

I think it would be very helpful to every operator if sometimes she would endeavour to look at operating from points of view other than an operator's. Try to imagine yourselves as subscribers now and then, and that would soon make you put a greater value on each call. Sometimes because a number is passed from other positions the same interest is not taken in the subscriber as in a call from the operator's own position, the operator dealing with him forgetting that that call is just as important as any that originate immediately in front of her.

The theory of team work is that operators shall help each other and see that the calls are taken in their turn, and *each* operator is responsible for three positions, even though every position is occupied. Then again, if an operator is at the end of one supervisor's section it does not follow that she must not do too much to help the operator at the beginning of another supervisor's section.

In helping from one section to another team working between teams is being carried out and the operators are showing that they understand the value of applying their theoretical knowledge of team work to practice.

* Abridged from paper read before the Liverpool and Birkenhead Operators' Society.

NATIONAL TELEPHONE STAFF TRANSFER ASSOCIATION.

Glasgow.—*The Position of the Staff.*—The deplorable prospect of the Company's construction staff being disbanded has of late occupied the minds of all the Company's employees. In Glasgow, where the general question has been rendered still more acute owing to the negotiations between the Company and the Post Office in respect of a special working arrangement in the Glasgow area, the local staff has sounded its grievance with no uncertain voice.

On Saturday, March 27, at the instance of the National Society of Telephone Employees, a public meeting was held in the Trades Hall, when resolutions were put by members of the National Society of Telephone Employees and the National Telephone Staff Transfer Association, the two societies supporting each other.

(*a*) Protesting against the threatened discharge of the constructional staff of the National Telephone Company and calling upon the Government to provide for their future employment either with the Post Office Department or by means of an arrangement with the Company; and

(*b*) Calling upon the Postmaster-General to adopt the principle which the President of the Board of Trade had insisted upon in the case of the proposed amalgamation of the Great Northern, Great Central and Great Eastern Railway Companies, viz., that persons in the permanent employment of the Company are not to be discharged in consequence of the working union without adequate compensation.

This meeting was well attended, and the chair was occupied by Councillor J. Alston, who was accompanied by several members of the Glasgow Town Council and other prominent men, who, in turn, expressed the liveliest sympathy for the staff in its present position, and considered the situation had only to be brought to the notice of public men to have the grievance removed.

At the instance of the National Telephone Staff Transfer Association, a further mass meeting of the staff was held on Tuesday, April 6, in the Royal Exchange, when some 300 members were present. Mr. Wm. Allan, chairman of the local branch of the Staff Transfer Association, presided, and Mr. W. A. Valentine (chairman of the central committee) was also on the platform. The election of office-bearers and other formal business was transacted, and statements made by various speakers explaining the position of the association's efforts on behalf of the staff.

The topic of most immediate interest to the staff and to the public dwelt upon by several of the speakers was the unsatisfactory position of the construction staff. The absolute artificiality of the position was emphasised, and it was pointed out that, although repeated efforts had been made to find from both parties (viz., the Post Office and the Company) what was the barrier which prevented their coming to some arrangement, no satisfactory reply had yet been obtained.

It was strongly felt that, pending a speedy settlement, the question of arbitration should be urged on both parties in order to prevent the staff suffering hardship.

FARMER'S SON.—Say, pa, I see by the papers they can telephone from the trains.

Farmer.—Well, anyone ought to be able to tell a 'phone from a train. Can you?—The *Operating Bulletin.*

The National Telephone Journal.

"BY THE STAFF FOR THE STAFF."

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WHAT IS A PRIVATE WIRE?

JUSTICE is usually represented as blindfold and holding in her hand a pair of scales. When those scales oscillate with such surprising and disconcerting changes, as in the recent case affecting private wires, one begins to picture the symbolic balances as of some strange alternating or see-saw pattern.

On April 2 the House of Lords reversed the decision of the Court of Appeal as to whether the erection of private telephone lines from A's to B's premises was an infringement of the POSTMASTER-GENERAL'S monopoly. The special case which had been heard before Mr. Justice SWINFEN EADY in March, 1907, dealt with two schedules, the first of which included private telephone lines from a theatre to a fire station, a doctor to a chemist, a theatrical ticket agent to a theatre, from a company to its solicitors, and so forth; while the second included fire alarm signals in which no telephone was used whatever. Section 5 of the Telegraph Act of 1869 excludes from the statutory monopoly of the Post Office "telegrams in respect of the transmission of which no charge is made, transmitted by a telegraph maintained or used solely for private use, and relating to the business or private affairs of the the owner thereof," and "telegrams transmitted by a telegraph maintained for the private use of a corporation, company or person, and in respect of which, or of the collection, receipt and transmission or delivery of which no money or valuable consideration shall be or promised to be made or given." The Company contended that the telephone lines included in Schedule 1 were for all practical purposes lines from A to A; that a doctor who had a private telephone to a chemist for the purpose of ordering drugs or giving directions for the despatch of medicine to his patients made, in effect, the chemist his agent; that a company speaking over a private line to a firm of solicitors used it no more and no less as an exchange line than when speaking on a private line from its manager to its engineer or any other officer; and that the publisher of a newspaper telephoning over a private line to his printers was surely talking to his agent just as much as the editor or publisher of the newspaper which did its own printing when telephoning to his printer. In all these cases the first party mentioned pays for the telephone and no question of charge per message (or otherwise) to the second party arises. As regards Schedule 2, the Company maintained that fire alarms and similar signals related to the business or private affairs of the respective owners thereof, that no charge was made for the transmission of the signals, and that the apparatus was maintained solely for private use. Mr. Justice SWINFEN EADY decided against the Company on both schedules, and declared that the "telegraphs" in Schedule 2 (not being fitted with telephones) were not within the Company's licence. The Company appealed, and the three learned judges constituting the Court of Appeal (the MASTER of the ROLLS, Lord Justice FLETCHER MOULTON and Lord Justice BUCKLEY), experts versed in the intricacies and subtleties of the law, declared in the Company's favour on the construction of the Act, although the MASTER of the ROLLS decided against the Company on a new point which he had himself suggested on the interpretation of the Company's licence. The Post Office thereupon took the matter to the House of Lords. Now five learned law lords, the LORD CHANCELLOR, the Earl of HALSBURY, Lord MACNAUGHTEN, Lord COLLINS, and Lord GORELL, equally and indisputably experts in the intricacies and subtleties of the law, have found themselves, "with the utmost respect for the Court of Appeal," unable to accept their view. The LORD CHANCELLOR animadverted on "the slovenly manner in which even public Acts of Parliament were expressed," and designated as clumsy the language of the two paragraphs of Section 5 of the Telegraph Acts which were in question. Thus the POSTMASTER-GENERAL remains, at the third time of asking, in possession of the field; the Company is liable for royalty in respect of the A to B lines beforementioned, and precluded altogether from establishing fire alarms and signal systems where no telephone instruments are used. From the point of view of the general public the latter decision will have some extraordinary and interesting effects. Not only cannot the Company or any other firm instal a fire alarm or any other public form of bell signalling without obtaining a licence for the purpose, but the ordinary electric bell at the street door is an undoubted contravention of the POSTMASTER-GENERAL'S monopoly of telegraphs. For it follows inevitably from the learned law lords' interpretation of the Act that an electric bell wire is a "telegraph" over which B, C and D, and others who push the button send "telegrams" to A, and unless its use were confined to A and his family when ringing their own front door bell it is plainly not an A to A line, free of royalty and not amenable to licence. It will be interesting to see whether all builders and electric bell suppliers will have to apply to the POSTMASTER-GENERAL for a licence and whether householders will be called on to pay arrears of royalty to the Government.

TELEPHONE STATISTICS.

A PARAGRAPH in the Press recently gave an estimate of the telephones of the whole world. They were computed at 9,500,000, of which 2,000,000 were said to be in Europe and 7,000,000 in America. Telephone statistics are singularly difficult to obtain. Official figures published by Government Administrations are in many cases nearly two years old, whilst the various companies,

ranging from huge national concerns to small bodies, providing the telephonic accommodation of a single country town in many cases publish no statistics and are besides so numerous that it is difficult to take count of them, so that the statistician is driven back on an intelligent estimate.

The estimate above referred to, which we have been at some pains to check, appears to be remarkably correct, assuming that it applies to the state of affairs at the beginning of the current year. At Jan. 1, 1908, official statistics (except in minority of States where estimates based on earlier data have been resorted to) show that there were roundly 2,160,000 telephones in Europe, 70,000 in Asia, 20,000 in Africa, 65,000 in Australasia, and about 6,300,000 in America (including, of course, Canada, Mexico and the whole of South America), or, 8,615,000 in all. Supposing the rate of increase to be fairly uniform, there should now be about 9.500,000 telephones in the world, of which upwards of 6,900,000 are in America, 2,400,000 in Europe, 85,000 in Asia (chiefly in Japan—71,000, India and the Dutch East Indies), 20,000 to 30,000 in Africa, and 70,000 to 80,000 in Australasia.

The reason why Europe cuts so poor a figure in comparison with America is that four or five of the most civilised and populous countries are extraordinarily backward in telephonic development. France, Austria, Hungary, Belgium, Holland and Italy—in the first four of which the telephone is entirely in the hands of the Government—may be instanced. In the whole of France there are less than 200,000 stations, and in Austria and Hungary combined there are actually fewer telephones than in the city of Chicago. Ancient cities of universal renown, counting 400,000 or 500,000 inhabitants, and moreover of great commercial importance, such as Lyons, Marseilles, Naples, Antwerp and Prague, are far behind American towns with 50,000 to 100,000 inhabitants, such as Peoria, St. Joseph, Dayton and Norfolk (Virginia), which few Europeans have ever heard of; whilst Vienna with a population of nearly two millions has not so many stations as San Francisco with 350,000 souls. If the countries of Central and Western Europe were as well developed telephonically as even Great Britain and Germany, to say nothing of Scandinavia, the comparison with America would be vastly more flattering.

It is proposed shortly to publish some articles giving the latest obtainable telephone statistics of every country in the world, and particularly to show a list of cities with 10,000 stations and upwards, which is a reasonable standard for an important city to attain. Comparisons are sometimes odious, but when due allowance is made for modifying circumstances, they are often very instructive, and we shall be very glad to receive from subscribers abroad and in the Colonies any reliable data which will assist in making the series more complete.

HIC ET UBIQUE.

As already mentioned the Annual Meeting of Officers takes place on May 20 and 21. The two days will be devoted entirely to the consideration of the problems, "Traffic" and "Traffic Organisation," and there is every promise of a most instructive discussion.

Electrical Industries, which is usually well informed in telephone topics, commenting on the matter, says:

Until recent years the National Telephone Company was probably too busy trying to live at peace with its enemies and to develop its business against obstacles imposed by the Government to find time for the intricate, prolonged, and rather costly operations involved in a proper study of telephone traffic. The American telephone companies, working under the despised and played-out system of independent private enterprise, have developed an extraordinarily efficient service; and much of the efficiency depends upon the minute study given to traffic problems. Mr. Goddard and Mr. Cook visited the States last autumn on behalf of the National Telephone Company, and made a special study of the methods adopted there for organising telephone traffic. The NATIONAL TELEPHONE JOURNAL hints that the result of their visit and of the forthcoming discussion will be to bring this matter into greater prominence for the benefit of the British telephone service. There are too many people who believe that telephone business is a mere matter of laying down so many lines and "spares"; beyond that, all they think about is the adjustment of rates. We hope that the National Telephone officials' interest in the details which mean so much for efficiency will not be allowed to decay when they come under Post Office control. Government Departments are the last places where one expects to find a living interest in a policy which involves continual investigation and adjustment of technical and operative details. *Meanwhile it may be noted* that Mr. Buxton's replies to questions about the discharge of telephone employees and the inadequacy of expenditure on telephone expansion continue to be vague and unsatisfactory. It is clear that the terms of purchase preclude the proper development of telephone facilities; and the Postmaster-General has not yet been able to find a way of providing the capital for lines which will not be remunerative until after 1911. The longer the delay, the heavier will be the demands upon his funds after the telephones are taken over. Telephone employees are agitating in various parts of the country about the discharges, actual or imminent; and it is about time that the public was agitating for the full telephone development which was supposed to be ensured by the Government policy. But, characteristically enough, all that the public thinks about is the retention of the flat rate.

AT the beginning of the current year there were 164,208 telephones in London (111,786 National and 52,422 Post Office). The 111,786 National stations in London constitute more than a fourth of the 441,129 stations of the Company in the whole of the United Kingdom. In Greater Berlin there were 139,622, of which 103,524 were in Berlin proper. Exchange VI possessed the enormous number of 25,712 "connections," Exchange I 19,608, and Exchange IV 18,250. The Post Office Central and City Exchanges which are contained in one building serve together 24,236 stations, and the Company's Gerrard Exchange 17,042. Paris at Jan. 1 had 65,033 stations.

WHEN is a telephone not a telephone, a bell wire not a bell wire, a push button not a push button? When it's a telegraph. . . . This is not a perplexing Christmas conundrum with an irritating catch in the answer, but a problem the solution of which represents the concentrated wisdom of many distinguished legal luminaries and an incalculable amount of time and money. Who would suppose as he rang his friend's electric door-bell that he was sending a "telegram" and causing an infringement of the Postmaster-General's monopoly?

WHEN a new telephone operator is appointed in a small English county town, the public mind is unruffled and the public Press callously silent. Not so in the Wild West. A new operator was recently appointed at Downing, Missouri, who chanced to rejoice in the surname of Mustard. "Smart, of course," said the *Keokuk City Gate*. "This ought to mean a spicy service," said the *Keosangua Republican*. "She will be a hot one," said the *Bloomfield Democrat*. "She'll blister the guy who wants to know if that clock's right" said the *Downing (Mo.) News*. "Guy," we believe, is a disparaging equivalent of "person."

THE Ameer of Afghanistan will soon be in telephonic communication with India (says the London correspondent of the *Manchester Guardian*). Already the wire has been carried from Jellalabad to Herat, where there is a halt until the route to Herat has been properly surveyed. So far there has been no serious tampering with the wires by nomadic tribes, who, naturally enough, resent the whole arrangement.

ANOTHER case of heroism on the part of a telephone operator is reported from America. Miss MacDonnelly, an operator, seventeen years old, at a branch exchange in a Wabash freight house, risked her life in endeavouring to save the warehouses from destruction by fire, while the little room in which the telephone switchboard was placed became filled with smoke. Miss Donnelly called the fire department and rang up every yardmaster in reach

to send engines and move out freight cars containing almost £1,000,000 worth of freight. The engines came and the cars were moved to safety before the fire could damage their contents. Finally, when the flames had entirely consumed her hat and purse, which lay on a chair near the switchboard, Miss Donnelly fell in a swoon, overcome by smoke. As she dropped from her stool to the floor she screamed once, and that scream was all that saved her life. Two clerks heard the scream and rushed to the switchboard, where they found the unconscious girl. Not five feet from where she lay a partition of the room was in flames. She recovered quickly when brought into the open air. The bravery and devotion to duty of this operator, says *Telephony*, won the most hearty praise from the Chicago newspapers and from thousands of people who read the statements in the Press.

WE have often recorded cases of the usefulness of the telephone as a burglar alarm, but the following case is an unusual one: Some thieves broke into a store near Ascot and were very busy at their vocation, when one of them accidentally touched the telephone handle. This caused the indicator at the exchange to drop, and the operator on duty promptly answered the call. As no reply was forthcoming, he rang the bell on the stores instrument, and this so alarmed the burglars that they decamped without opening the safe, thinking, perhaps, that there was someone occupying the rooms at the back who would come to answer the operator's repeated ringing, or that some message was being sent to the police.

SWITCHBOARDS—PAST AND PRESENT.

BY JOHN E. STANTON, *Nottingham Factory.*

(*Continued from p.* 11.)

ANOTHER type of board which came into favour about this time, principally on account of its neat appearance, was made on what was known as the Swiss commutator principle (Fig. 7). The line

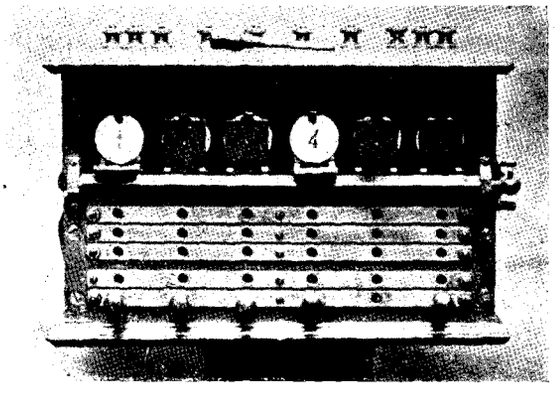


FIG. 7.

wires were joined to terminals, thence to the indicators and on to brass bars at the back of the switchboard. On the front of the board were another set of brass bars at right angles to those at the back holes were drilled through the two bars as shown, and connection was made by plugging into the two numbers required on same bar. This was also applied to large sectional switchboards in exactly the same manner. The next board to which I would call your attention is the Williams' slide bar. I should have liked to show an illustration of a large section, but unfortunately I have been unable to secure one. However, I have a photograph of a small three-line board of the same principle (Fig. 8). The lines come into the indicators and then to the vertical brass bars, on which are fitted slides which make good contact with the bars, yet are free to slide up or down. Behind the bars are fitted ebonite strips in which are fixed brass studs, and these are connected together in rows horizontally. The normal position of the slides is at the bottom when all the lines are earthed. The connection is made by putting the slides on any row of studs. On the large section the bars are fitted in exactly the same way, but in place of studs round brass bars run the length of the section, behind the sliding bars, the operating being exactly the same as for the small board.

We now get another step further, and this is about the first switchboard on which were used round plugs in connection with cast body jacks (Fig. 9). The connections and methods of operating were practically the same as with the slipper board.

Single-cord switchboards have been very much used by the Company and have proved very efficient. In fact, the board

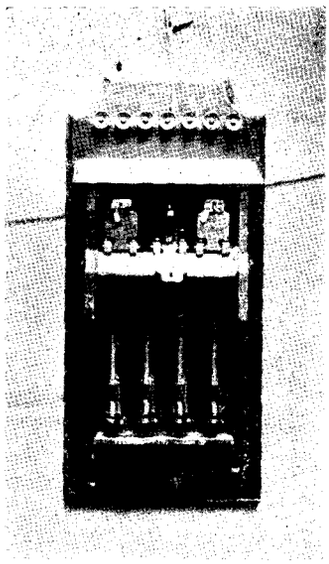


FIG. 8.

illustrated only came to the factory from Glasgow a month or so back, and you can see for yourselves that its birthday was in 1892, which gives sixteen years' service—proving that the board was working fairly satisfactorily or it would have been ousted long ago. I might add that some of these boards have come under my notice where the jack holes have actually been broken into one another with wear. True, they now appear to us to be very clumsy and take up a lot of room; but, at the time they were brought out there is no doubt they were a great advance (Fig. 10).

The connections are very simple. The line is brought direct on to the jack, through the indicator and terminates on the plug,

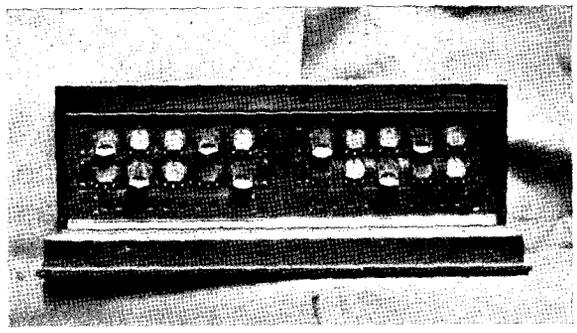


FIG. 9.

which is earthed while at rest in the plug hole. The call is answered by the operator plugging in her instrument and then using the plug of calling subscriber in the wanted subscriber's jack. The indicator of that cord operates a ring-off.

Fig. 11 is a picture of a large section for 150 lines, which has also done very good service.

An improvement was added to this type of board, a two-way plug being substituted for the single operator's plug. This was joined up to operator's set with a Dewar key in circuit. This simplified operating very considerably, and for that period quite a

remarkable speed was obtained in making and answering calls. On the indicator falling the operator inserts her plug in the jack and obtains the number. The calling subscriber's plug is placed in the jack of the number required, the operator then pulls over the key, which rings through both lines. When conversation has commenced the operator withdraws her plug.

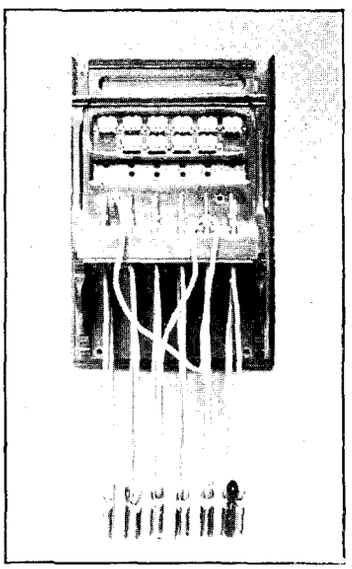


Fig. 10.

We now get a decided improvement in switchboard design (Fig. 12). This type has the cord circuits quite distinct and separate from the line circuit, which is the principle upon which all modern boards are worked. The cords and plugs run in pairs, one plug being known as the answering plug, the other as the calling plug. On receiving a call the operator takes the answering plug of any pair and plugs into jack corresponding to the indicator which has dropped, pulls over the cam lever of that cord which puts the

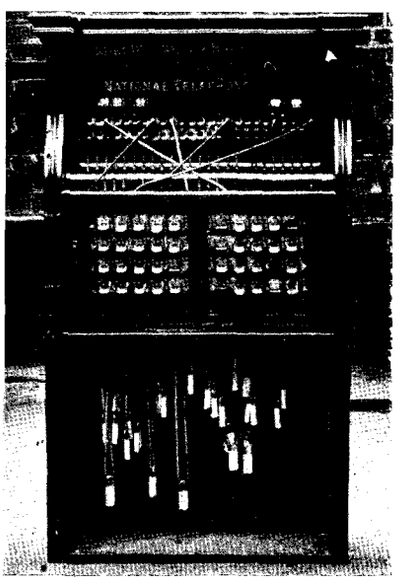


Fig. 11.

operator's instrument in circuit. Having ascertained the number required, she takes the calling plug of the pair and plugs into the jack. The ringing key is pressed for a moment which rings up wanted subscriber. As soon as operator is satisfied that conversation has commenced, the cam lever is raised which cuts out the operator's instrument and leaves the two lines in circuit through the ring-off indicator. On finishing conversation the subscribers give one or two turns to generator which drops indicator, and the operator then restores everything to normal.

Fig. 13 is Ericsson's cordless switchboard. Of course the peg board and Gilliland boards were cordless, but this is quite on a different scale, and is one of the first Ericssons brought out. At the top of the board are two rows of indicators. Underneath the indicators are five rows of 26 keys; at the side of the keys are five

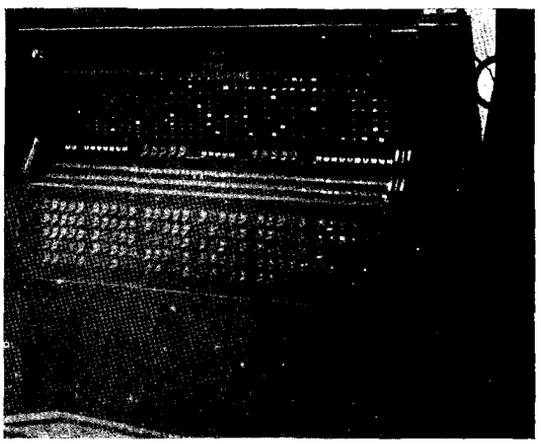


Fig. 12.

ring-off indicators. Each key has two moving springs, which in normal position make contact with two inside springs. When the key is depressed the moving springs break with inside springs and make with two outside springs. The lines are brought direct on to the two moving springs of the bottom row of keys, the two inside springs of that key are connected to the moving springs of the key above and so to the last key, the inside springs of which are joined to the indicator. The outside springs of all the keys are connected by common wire running across the whole 25 keys. When a shutter drops the operator depresses key of the corresponding number, any of the five and her own key on same row, answers

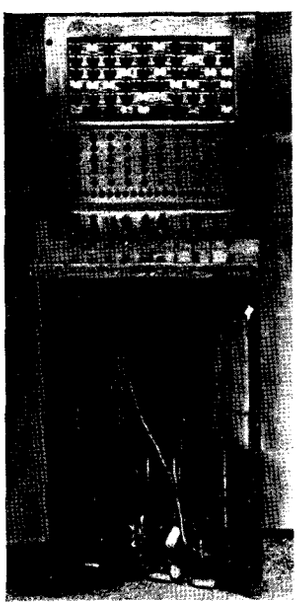


Fig. 13.

call and depresses key of number required on same row, which cuts out indicators and short circuits the lines through the common wires. Perhaps it will make it a little more clear if we remember that the five rows of keys are practically equal to five cord circuits.

(To be concluded.)

THE LIFE OF A WORKS ORDER.

By G. W. Bromhead.

It is necessary for me to offer an apology for occupying space on a subject which has been already so extensively and ably dealt with in the columns of the JOURNAL, but my plea is that this subject has not previously caught the eye of a few here and there—just one or two in the crowd.

The works order, as is obvious from its name, is an order for work and has to be issued before any work can be carried out and indeed is the only authority for such work.

There are, of course, various types of works orders but I do not propose to deal with them in bulk, but to take an individual one, the "N" works order. Let us, for a moment, consider how this works order is originated. The zealous contract officer in the execution of his daily round, calls upon, say, a Nonconformist minister and with that fluency for which he is so justly famous, informs him how necessary it is he should be connected with the telephone system. The reverend gentleman protests that he cannot quite see the use he has for the telephone, whereupon the representative of the Contract Department with delicate tact, points out the various advantages the telephone possesses, and how the minister could book a seat at the theatre or summon a friend to make a fourth at bridge by means of the telephone. The minister cannot withstand these alluring arguments and the order is signed without further demur, whereupon we see the contract officer returning to the office with a happy smile upon his face supremely and blissfully content in the knowledge that he has by his own commendable astuteness, and his facility of resource in argument, brought another unbeliever into the subscribers' fold.

WHY IS IT?

That an Auditor always turns up on the only month your books won't balance?

The agreement is then accepted by the contract manager and passed on to the district office where it lies in a box or drawer in a state of chrysallis to burst forth in due course into a resplendently pink and blue works order. (Old gold and terra cotta would make an irresistible combination; but this is only a suggestion.) This virgin works order is then passed on to the local office where the local office clerk cannot help contrasting it as it lies there, crisp and clean, with the dirty works order that has gone the rounds and just been gathered in from the mysterious recesses of a foreman's pocket, where it has peacefully lain with an ounce of shag for company for some considerable time. He also mournfully soliloquises on the cruelty of a fate which is to drive this nice clean works order out into the cold hard world from whence it will be returned maimed, torn and dirty to be ultimately laid at rest, along with others, in a peaceful grave consisting of a cupboard with a little cardboard tablet affixed to the outside, bearing the inscription, simple but none the less sincere, "works orders for 1908." Peace be unto its ashes.

Having been duly entered up in the local works order book the two slips are then separated, the pink one being passed on to the engineer and the blue one going to the switch-room for the telephone number to be allotted and thence to the chief inspector. The engineer passes the pink slip on to the foreman, who runs the line, fills in the columns at the back provided for the purpose of showing the stores and the amount of wire, etc., he has used on the job, whereupon it is checked by the engineer with the stores slips, the amount of underground wire picked up—if any—shown, and it is then returned to the local office.

The chief inspector gives the blue slip to the fitter who fits the instrument and returns the slip to the chief inspector who, after checking the stores booked out on the back, sends it to the test clerk for particulars as to the subscriber's apparatus to be recorded, and then it is duly returned to the local office where it is reunited to the pink slip. The complete works order is then carefully checked and marked off in the local works order book and returned to the district office where it is duly filed away after the account for rental has been sent and the particulars of mileage, etc., entered up in the record books provided for that purpose.

Thus it will be seen that even such a prosaic thing as a works order does not lead an altogether uneventful life.

CORRESPONDENCE.

THE VALUE OF THE "UNSUCCESSFUL" INTERVIEW CARDS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I AM pleased to see that my paper under this heading has aroused the interest of my fellow contract managers, but I wish that the subject had been one of those set down for discussion at the Annual Meeting of Contract Managers and Contract Agents alone at Head Office. Discussion by correspondence is of necessity a slow method and one that presents opportunities for misunderstandings. An example of this occurs in my use of the words "suspense or diaried cards." Mr. Nicholls has been led by this to say: "I cannot follow the inconsistencies of the paragraph dealing with house to house canvassing," and "Northern Province" says it is easy to confound me by my own article. In the circumstances both of these remarks are justified. What I really referred to was the cards actually diaried to come out for a further call on a certain date, while the "suspense" cards are of course all of the unsuccessful cards.

Any further argument of the value of the cards in advertising campaigns would, I think, be futile, in view of Mr. Goddard's instructions at the recent meetings. My paper was written and sent to the Editing Committee before these were held, in fact so long before that I presumed that they refused to allow me to rush along the path "where angels fear to tread," and had placed it in the waste paper basket.

Mr. Nicholls is correct in stating that the using of the cards as a diary is not referred to in the instructions, but despite this I consider the system useful and economical. Surely it is quicker and cheaper to mark the required date on the top of the card than to make the contract officer enter the name, and presumably the name of the street, in a diary; after this the cards must be carefully filed in their numerical order in street order, and then taken out again on the proper day. Who does this I wonder, the contract officer or the office staff? The less clerical work, consistent with their making full and clear reports, that we give the contract officers to do the better; the Company wants them to work out of the office, not in. The dating of these cards must be carefully done or the result will be that the contract officer will be "hopping about" the town instead of having his day's work so arranged that he can work right through a certain street or neighbourhood. My method of handling these cards is that they are filed in date order by the office boy, each man's cards separately, in order that a card required urgently may be quickly found, and each morning the boy brings out those which are ripe.

Here I should say that I see all the contract officers personally each morning and go through the reports with them, and I can assure "Northern Province" that I have never found any difficulty in getting them to give full information on their cards or to carry out any instruction that I may have to give them. If such a difficulty as this should ever arise it would be time that either the man or I should find some other employment.

Mr. Nicholls states that the reasons I quoted "No good," "Cannot afford," should not be accepted as final by the agent who is alive to the work he has to do. The criticism is just a little severe but fortunately not justified. My paper states that the ground is being continually re-canvassed, and consequently these people, including those who "definitely decline," to whom "Northern Province" also refers, are canvassed again and again. "Northern Province" has not, I think, quite understood that these statements are reports of actual interviews and not comments passed by the canvasser from an outside inspection of the person's premises. I cannot agree with him when he states that these reports are those specially objected to in the service instructions—these are "out" and "call again." Even these reports are useful. The first shows, or should show, that a call has been made, and the residential canvasser in all districts on fine sunny days unfortunately has frequently to report that interviews are hard to obtain as so many of his prospects are out. I accept them as they help me to check a man's work—quite recently I had such a report given to me and I put on my hat and called on the prospect and found that no call had been made. The reporter is now seeking a fresh outlet for what he doubtless calls his energies. "Call again" is also helpful. It enables the contract manager to discover whether the canvasser is lacking in convincing powers or the facility to successfully handle a "wobbler."

My question with regard to special trade canvassing is deemed extraordinary by Mr. Nicholls He doubts whether there is a successful officer in the kingdom who has not experienced the receipts of orders from this source. I don't doubt for one moment. I feel certain that all of those who have tried it must have got orders. But I expect that the reports on the suspense cards will show in such cases that the orders are those that would have been obtained at much the same time by the ordinary canvassing. While the special canvass is proceeding the ordinary work is being neglected, and prospects that were nearing maturity have again to be worked up. If heavy plant difficulties exist which prevent ordinary work, or if competition exists when of course orders must be obtained with little regard to cost, then the case is of course altered.

Mr. Elliott very neatly summarises the *pros* and *cons*, but it must be remembered that I am not arguing against the *use* of these cards but against the retention of them in suspense drawers after the prospect has given a decided negative. This is another instance of the drawbacks to discussing the question in this way—my title is misleading, it should have been "The value of hoarding up, etc." I agree in the main with all of his claims for them with the exception of that relating to their use in advertising. He however assumes in his last reason, as does "Northern Province," that I was also discussing the new business card, which is not correct. He supports me in his reasons against them by an experience that is exactly similar to my own, and I thank him for his frankness.

I feel that our progress, in the provinces at least, is being secured from those who have many times been reported as "No good," "Definitely declined," etc., etc., and I ask, in conclusion, is it worth while to keep records of these failures? Is it not better to destroy them and tackle the people anew each time with the added canvassing power that each failure and each success has given to us?

April 6. E. SEYMOUR COOPER.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I HAVE read with a degree of interest the various remarks put forward by several contract managers, relating to the present method of recording interviews by contract officers.

I do not think that the system is at all at fault, but consider that it is most demoralising if a careless canvasser be allowed to run amuck amongst well placed and properly kept interview cards; the bull and china shop business is not in it. At the same time I cannot stretch as far as to find it "heartbreaking," as Mr. Maclure does; that anguish I prefer preserving for the unwritten contracts.

The gentleman who suggested that when a man refused to have the service, his interview card should be immediately destroyed, was surely trying to foist on his readers some description of April joke. I do not think that I am outside the mark in stating that 90 per cent. of the non-subscribers refuse the service when first approached, and refuse again, and yet again, but, notwithstanding this, "follow on," "follow on," should be the war-cry of the canvasser who is working on correct lines, until the walls of prejudice are beaten down, and the citadel is taken: only when a man dies, or otherwise crosses his country's bourne, should his interview card be converted to waste paper.

I have before me as I write an interview card on which the date of the first interview is given as June 24, 1905, and the result of that interview is practically a refusal of the service, and so on through all the years until April 13, 1909, when the contract was taken, and is now accepted.

I quite agree with Mr. Maclure that if cards are properly kept (and it is just as easy doing it right as wrong) they are an immense help, and a real boon to a fresh canvasser, who sees in a few minutes where his prospects lie for "quick," new business, and of course it is from the evidence given by these cards that judgment should be formed as to whether the canvasser should receive credit or commission, or neither, from contracts signed in the office, as he should produce his unsuccessful interview card instanter; if not, well no credit.

I suggest that these cards would be improved by being a shade bigger, but by all means let us keep the unsuccessful interview cards, and impress on the contract officer the seriousness of the offence of departing from the proper method of using them.

Brighton, April 15. D. WALLACE, Contract Manager.

IMPROVED SWEDISH TORCH.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

ALTHOUGH it is now six years since I left the Company I peruse the pages of the JOURNAL with great interest, and wish to congratulate you on the splendid success you have made this.

I was interested in seeing in your last issue that two old members of the staff with whom I was associated—McKie and Donaldson, Glasgow—have completed 25 years' service.

Perhaps it is not known that about 1890 or 1891 Mr. McKie suggested the adding of the soldering bit to the Swedish torch which formed so effective a piece of apparatus. He thereby improved the efficiency of the trunk lines by making futile the excuse that dry joints were left owing to the difficulty of getting a bolt heated in quiet districts, where men were repairing broken wires.

I expect it is not so much in evidence now that the trunk lines are out of the Company's hands.

Knotty Ash, Lancs, April 6. W. AITKEN.

OPERATOR'S PRIMARY CIRCUIT.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

SINCE it has become the rule to work the operator's primary circuit from the 24-volt accumulator wherever this is installed, a new feature has been introduced into the circuit, a detailed description of the action of which would be of interest to many members of the staff. The statements made here are based on the practical working of the circuit, and do not take into consideration the efficiency of the condenser or the impedance of the retard coil. Perhaps someone may be kind enough to throw some light on these two points, and, at the same time, correct me where I may be wrong, as it is for that purpose I put forward this letter.

Take, for example, the circuit of a common battery operator's primary (see Fig. 1), it is necessary to reduce the potential difference at the transmitter terminals to a practical working value. This is done by inserting the 165ω retard

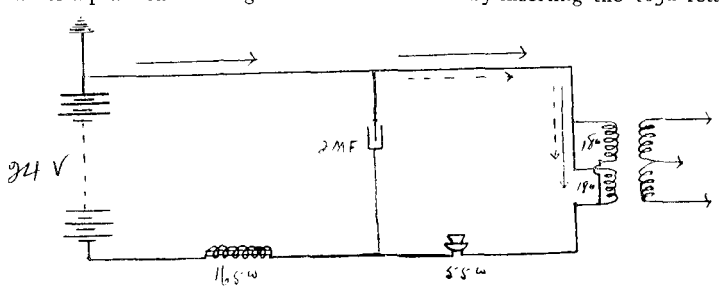


FIG 1.

Heavy arrows = direction of battery current.
Dotted ,, = condenser discharging current.

coil in series with the transmitter and primary winding of the induction coil. To simplify matters, assume the resistance of the battery and leads to be negligible, then the potential difference across the transmitter terminals = circuit = $\frac{24}{165 + 9 + 55} \times 55 = 0{\cdot}104 \times 55 = 5{\cdot}7$ volts (r = internal resistance of X transmitter). The actual potential difference is nearer 4 volts when the resistance of the leads is taken into consideration.

Before going further, consider a circuit with the same potential difference across the transmitter terminals, but with no retard coil or condenser in circuit, other conditions being the same. The normal current is 0·104 ampere, and with a drop of 10ω in the transmitter resistance it is 0·122 ampere, a variation of 17·3 per cent. through the primary of the induction coil. The same result is aimed at in the 24-volt circuit, and I will now endeavour to show how this is attained.

The normal current is 0·104 ampere, and with a drop of 10ω in the transmitter resistance it is 0·109 ampere, a variation of only 4·8 per cent., a big

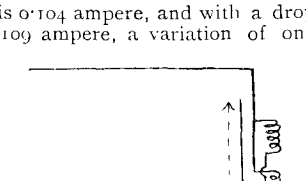


FIG. 2.

Dotted arrow = condenser charging current.

reduction from 17·3 per cent., and this is where the condenser action evidently comes in. With normal current (0·104 ampere) the potential difference across the condenser terminals = 0·104 × (9 + 55) = 6·5 volts. When the transmitter resistance drops 10ω it becomes 0·109 × (9 + 45) = 5·8 volts. The condenser partially discharges through the induction coil and transmitter and in the same direction as the battery current (shown by dotted arrows in Fig. 2, the heavy arrows showing the direction of the battery current). The self-induction of the retard coil prevents the condenser currents from flowing through the battery, throwing them through the induction coil and transmitter.

If we take this condenser current as exactly proportional to the variation in potential difference across its terminals, then it is = $\frac{0{\cdot}7}{45 + 9}$ = 0·013 ampere. This added to the battery current = 0·109 + 0·013 = ·122, or a variation of 17·3 per cent. through the induction coil. With an increase in the transmitter resistance the battery current is decreased and the potential across the condenser terminals increased, the condenser then charges up, the current flowing through the induction coil in opposition to the battery current, the actual current being the resultant between the two. The potential at the condenser terminal in connection with the + side of the battery remains practically constant, the terminal on the negative side being under a constant change while speech is going on.

Paisley, Feb. 11. W. LEITHEAD, Chief Inspector.

SELFRIDGES' PRIVATE BRANCH EXCHANGE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

WITH reference to Mr. Greening's article on "Selfridges' Private Branch Exchange," it is very interesting to stand beside this exchange for a little while and hear the remarks of some of the people who are watching the operating. One lady was heard to remark to her companion that the girls were weaving carpets. This remark was doubtless caused by the fact that the switchboard is in the carpet department, and another, that these were the typewriters. It is indeed a wonderful thing to think that such ignorance should exist in this twentieth century. W. F. TAYLOR, Contract Manager.

Salisbury House, E.C., March 31.

TEAM WORKING.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

ALTHOUGH the subject appears to be beyond the reach of controversy, especially in view of the recent Service Instruction, and though we bow to the opinion of others, we venture to ask that before closing the pages of the JOURNAL to the discussion we may be allowed to state why we consider competition in divisions good for the service and ourselves.

First, with regard to the principle. It is admitted that in respect of separate exchanges the principle is right, and, indeed, it obtains from nature itself and from the regiments forming an army in battle to the crews in a boat race. In the last case speed against time would never approach speed against a rival crew *rowing under similar conditions and at the same time.*

The contention therefore that the principle is wrong fails.

Then as to accuracy. If results may be compared between exchanges when the conditions must vary in equipment, load, percentage of junction traffic, percentage of party lines, rate of calling, distribution, etc., the small difference made by a few calls answered by operators in division one and credited to division two may be neglected.

Speed only is of little service we admit, but taken in conjunction with irregularities forms a really *sound basis* for comparison, especially if the average reply be multiplied by the number of irregularities.

Following out the simile of a football team used in your Editorial, we do not agree that the exchange staff should be compared to a "team" but rather to a league, composed of competing teams, each one of which is an entity in itself and competes with the others for the top place; which competition, while affording bright relief to the monotony of the work, has a direct bearing upon the betterment of the service.

We should like also to take exception to the statement that "team work by the whole staff carries with it a far higher ideal and motive." Our ideal is a commercially sound and perfect service, and our motive is to see which of us can do most towards attaining that end! Is there anything higher than this?

The advantages to the management also must not be overlooked, for divisions do not always work at the same section of the board, therefore if one division be always at the top and one always at the bottom the exchange manager can see that the strength of the divisions is not equal, and an adjustment of the staff may be made. Again, if the division at any one section of the board is always top, then it can be seen that the distribution is not even, and again that can be rectified.

As to ourselves, the real interest in the members of the staff forming our divisions makes for efficiency, for we got to know each other more intimately, help to rectify one anothers faults, and take pride in the visible record of our respective achievements; take this from us and we must lose interest, and resume the more monotonous system advocated under which we have worked, and which we were so glad to abandon.

E. FITZGIBBON,
E. E. SHORT,
Bristol, April 16. F. MANNING.

[We are glad to publish this letter, the rejoinder to which we are compelled to hold over to next month.—ED., "N. T. J."]

TELEPHONE MASONIC LODGE.

BY special dispensation of The Most Worshipful Grand Master, the installation meeting of this lodge will be held on Friday, May 21, 1909.

The Worshipful Master, Wardens and Brethren of the Telephone Lodge extend a hearty invitation to those provincial brethren who will be at the Officers' Meeting in London at this date, and who are not members of the lodge. Those desirous of attending are requested to communicate at once with the secretary, Mr. Patrick Kenny, 14, Greville Road, Walthamstow, Essex, when they will be furnished with a card of invitation, giving time and place of meeting.

THE TELEPHONE VOICE.

THE *Globe* has the following observations to make on the telephone voice:—"The tale, recently imported into this country from Africa, of a native who went mad on hearing a far-distant friend's voice through the telephone, sets a contemporary reminding its readers with what comparative speed we have accustomed ourselves generally to the use of a fairly new invention. Particularly is this shown by the manner in which people speak into the receiver. It is not long ago that there was a widespread tendency to raise the voice when telephoning. The longer, the louder was the involuntary rule. If only a local call was made you did not pitch your voice very much higher than in ordinary conversation. But if you rang up a number in Glasgow, supposing you yourself were in London, you just yelled, whether the line was acoustically favourable or not. Most people, whose voices are well-known to you conversationally, give a shock when you first hear them at the telephone. It is as though someone else, whose utterance had never hit your ear before, were suddenly talking. That is Jones' familiar figure clutching the receiver; but the voice is that of a complete stranger. Those, however, who are constantly using the telephone gradually acquire what we must call the telephone voice. A monotonous tone, distinct and, on the whole, effortless. The telephone voice is the product of an age in which a conversation over the wire is no longer marked by facial contortions.

DEATH OF MR. CEDERGREN.

WE regret to record the death of Mr. H. T. Cedergren, the leading spirit of the Stockholm Almänna Telephone Company, which took place on April 13. Mr. Cedergren was a progressive telephone man, and a most capable administrator and financier. His company not only carried on a successful competition with Swedish State system in Stockholm, but fathered telephone enterprises in Moscow and Warsaw. It may be remembered that Mr. Cedergren gave evidence before Sheriff Jameson at the Glasgow telephone inquiry in 1897.

LOCAL TELEPHONE SOCIETIES.

Birmingham.—At a meeting of this society held on March 23 a paper was read by Mr. Lloyd, entitled "Practical Application and Transmission." Diagrams were shown illustrating the instruments used in a standard transmission circuit, and also the curves used in obtaining the necessary weight of wire for the given length of circuit.

At a meeting of the above society held on April 6 competition papers were read by Messrs. Rhodes, Tuffin and Roth. Mr. Rhodes' paper, entitled "Keeping in Touch," dealt with contract matters, the lecturer pointing out the necessity for all members of the staff being conversant with the various rates. Mr. Tuffin's paper on "Exchange Maintenance" dealt with central magneto exchange, and was illustrated by several lantern slides showing the various connections of the board, and where faults were likely to occur and their removal, Mr. Roth's paper on the "Lighter Side of Inspecting" was a humorous recital on the duties of an instrument inspector. The lecturer dealt specially with the way subscribers vent their grievances on inspectors.

Bolton.—The prize night and last meeting of the session took place on April 15. Prizes were awarded to the following for the best papers of ten minutes' duration:—A. Whittaker, Electrical Department; V. E. Stott, Electrical Department; E. Kilcoyne, Engineering Department; E. Taylor, Clerical Department. Mr. Haley presided, and great interest was displayed by all present.

Brighton.—At a meeting on March 10 competitive papers were given by Mr. C. Hooper on "Common Battery Exchange Maintenance Routine"; by Mr. F. Gambier on "Common Battery Extension Working"; and by Mr. F. Boardman on "Private Branch Exchanges." The prize was divided between Messrs. Gambier and Boardman. Mr. C. F. Moorhouse presided, and a short discussion followed the papers.

Bristol.—The fifth meeting took place on April 15, when Mr. Salmon, the Head Storekeeper, read a paper on "Methods of Dealing with Stores and Stationery by Head Office." A very keen interest was taken in the paper, and numerous questions were asked at its conclusion. Mr. Dalzell, the Provincial Superintendent, presided, and expressed the thanks of the meeting to Mr. Salmon for so kindly coming down specially from London. An announcement was made to the effect that the society will meet in August next for the purpose of arranging a programme for next winter's session.

The sixth meeting was held on March 18, when Mr. L. F. Morice, of the Bristol local office staff, gave a lecture, entitled "Underground Construction." There was an attendance of 83 per cent. of the members, and twelve visitors also were present. Mr. Perkins, the District Manager, presided. A remarkable feature of this meeting was the presence of so many members of the line staff, a number of whom took part in the discussion which followed.

Cardiff.—The sixth and last meeting of the session was held at St. John's Schoolrooms on March 18, Mr. W. H. Kirk, vice-president, being in the chair. There was a good attendance. Mr. R. A. Dalzell (Provincial Superintendent) read a paper before the society entitled "Costs." He also gave some very interesting abstracts from the General Superintendent's paper on his visit to America, and Mr. Hare's paper on "Capital."

Cheltenham.—At the eleventh and final meeting held on March 23 (the whole available staff being present) Mr. R. T. McCahey gave an interesting paper on "Various Exchange Systems," illustrated by slides kindly lent by Head Office. The attendances for the session work out at 99·48 per cent. of the available staff, a result which speaks well for the enthusiasm of the Local Manager and his staff.

Cork—At an adjourned meeting of the society held on March 8 (Mr. A. M. Kidd, District Manager, president, in the chair) two very interesting papers were read in the presence of a fairly good number of members. The first paper was by Miss M. Gallagher, Chief Operator, on "Operating," in which the lady showed a thorough knowledge of the subject. The second paper was read by Mr. G. Henry, Stores Clerk, on "Stores and the Method of Dealing with." He gave some illustrations of interest on the blackboard, showing how cards, etc., should be properly kept.

Dublin.—A meeting was held on March 31 in the Superintendent's office, the subject being "Measured Rate Accounting," and the reader Mr. T. J. Early, Chief Clerk. There was an attendance of 72 per cent. of total membership. The final meeting is to be held on April 21, this evening being devoted to an exhibition of lantern slides by Mr. R. B. Graham.

At a well attended meeting of this society Mr. F. C. Scannell read a paper on "Ireland's First Common Battery Exchange." Mr. Scannell treated his subject in a very masterly manner, and by means of carefully prepared diagrams explained the intricate working of exchanges on the common battery system, and more particularly the installation of the new common battery switchboard at Londonderry; an interesting discussion followed.

A special meeting was held on April 16, in order to take advantage of Mr. Gill's presence here, to give the society a short talk. A full attendance of members and 63 additional members of the staff were very interested in the exhibition of lantern slides and what Mr. Gill said. The Superintendent for Ireland presided, and the District Manager was also present.

Eastbourne and Hastings.—The third meeting of this newly formed society was held on April 6; 41 members were present, including a large number from Hastings with Mr. Armstrong their Local Manager. Mr. N. C. Bilton gave a lecture on "Batteries as Applied to Telephony," and an interesting discussion followed. Mr. R. Curling, Local Manager, Eastbourne, presided.

East Kent.—The last meeting for the session 1908-9 was held in the district offices, Dover, on April 13, when a paper was given by Mr. F. J. Sandiford, Chief Inspector, Margate, on "Magnetism and Electricity." Mr. F. H. Elgie, Wayleave Officer, Dover, also contributed a paper on "The Experiences of a Contract and Wayleave Officer"; 32 per cent. of the members attended.

Exeter.—On March 23 the president of the society, Mr. R. A. Dalzell, gave an address on "General View of Progress in the Province with some Important Points for Consideration of the Staff" to a full attendance of members. Mr. H. Reid was in the chair, and Messrs. Martin, Brown, Robnett, Williamson and Squire took part in the subsequent discussion.

Glasgow Operators.—The sixth meeting of the session of the Society was held in the Masonic Halls, West Regent Street, Glasgow, on the evening of March 22. There was a large and representative attendance of members present. After tea, prize essays on "Night Operating—Attention to Order Wires" and "Telephones and Telephone Operating," contributed respectively by Mr. John Paton and Miss J. McKinnon, were read by Mr. Rodger. Questions and discussions were invited and Mr. Rodger made a few remarks on the papers expressing the society's indebtedness to Miss McKinnon and Mr. Paton. The prizes were thereafter presented to Miss McKinnon and Mr. Paton by Mrs. B. M. Peters, and an encouragement prize was also presented to Miss E. Finlayson.

The sixth meeting of the club was then held, when a programme consisting of songs, readings, dialogue and dancing was greatly enjoyed by all present.

Glasgow.—The annual business meeting was held in the Technical College on March 24. The retiring committee made several recommendations with a view to enhancing the popularity of the society; one proposal being that a demonstration might be held, when the work of each department would be demonstrated and explained to the members. These recommendations were unanimously adopted by the meeting. The hon. presidents and vice-presidents were re-appointed, and the following office bearers, together with a committee of management, were elected:—President, Mr. A. B. Gilbert; vice-president, Mr. T. Pettigrew; secretary, Mr. James F. Scott; treasurer, Mr. A. S. Duncan.

Gloucester.—On April 8 the seventh meeting of the session was held; attendance 75 per cent. Mr. C. Elliott, District Manager, in the chair. Two most instructive, interesting and well-written papers were read upon operating subjects. Paper 1 was read by Miss Harrhy (Clerk-in-Charge) upon "The Different Classes of Services from the Operators' Point of View." The second paper was read by Miss Gauntlett (Senior Operator), her subject being "Aids and Hindrances to a Good Service from an Operating Point of View." Mr. C. Elliott, District Manager, cleared up many difficulties and gave some most interesting information and narratives which proved very helpful and profitable.

Greenock.—The eighth meeting of this society was held on March 10, Mr. A. Ramsay Lamb presiding, when a lecture entitled "Survey of Plant" was given by Mr. J. McClintock. The paper was most interesting and instructive, and was highly appreciated by the members present.

The ninth meeting was held on April 7, the president, Mr. A. Ramsay Lamb, occupying the chair. Mr. P. Smith, jun., Contract Officer, delivered a paper entitled "Useful Scientific Data." A number of interesting practical experiments were shown illustrating scientific facts which would be serviceable, especially to the technical members of the society.

Hanley.—On Jan. 21 Mr. R. E. Deakin read a paper on "Party Line Working." This was followed by a paper on "Ohms Law" by Mr. W. D. Edwards.

On Feb. 4 Mr. W. E. Hurlbut gave a paper on "Surveying for Pole Routes."

Mr. John Scott read his paper on "Some Notes on Management" on March 4, when the whole of the members were present.

Isle of Man.—The eighth meeting was held on March 19, when a very interesting and instructive paper on "Faults" was read by Mr. C. Quayle, Fault Clerk. Considerable discussion took place after the paper had been read.

The ninth meeting was held on April 2, when a paper on "Switchboard Working" (with diagrams) was given by Mr. C. Chambers, of Engineer-in-Chief's switchboard staff. He very kindly consented to give this paper in place of a paper by Mr. W. Kelly, Chief Clerk, as it was thought that at this time, with our underground work in progress, a technical paper would be of more advantage than one on office work.

Leicester.—On March 12 Contract Officers Bailey, Cosgrove, Reeves and Hawkins read a series of papers dealing with "The Contract Work through the Eyes of the Contract Officer." Mr. F. H. Tyas, Contract Agent, occupied the chair.

On March 26 Mr. F. G. C. Baldwin, Birmingham, gave an interesting lantern lecture on "Present-Day Practice in Dry-Core Cable Work."

Liverpool and Birkenhead.—The eighth and final meeting of the session was held on April 15, the president, Mr. E. J. Hidden, presiding. A competition had been arranged for ten-minute papers, six of which were sent in as follows:—"The Telephone Directory," by H. Hincks; "Condensers," by R. H. Dougan; "Reminiscences," by Miss E. M. Jones; "Fire Alarms," by R. Buckles; and "Line Faults and the Men who Clear Them," by T. Beesley and W. Taylor (two papers). Without exception the papers were excellently written and rendered, some very interesting points being brought out by each of the contributors. Two prizes of £1 1s. and 15s. were offered by the society, and the prize fund was supplemented by a third prize of 10s., which was kindly presented by the Provincial Superintendent, Mr. R. Shepherd. The winners were decided by ballot, which resulted in R. Buckles being first, T. Beesley second, and Miss E. M. Jones third.

Liverpool and Birkenhead Operators.—The closing meeting of the session took place on March 29, the president, Mr. E. J. Hidden, occupying the chair. A number of short papers which had been prepared by members were read as follows:—"First Impressions," by Miss M. Parry; "Subscribers," by Miss Bibby; "Operators," by Miss Dalgarno; "Mersey Docks and Harbour Board Private Branch Exchange," by Miss E. Smith; and "Retrospection," by Miss E. M. Jones. The second part of the programme was filled in by a number of "two-minute" speeches, made by male members of the staff, who had been invited to the meeting without any notification that they would be expected to speak, and did not know on what subject they would have to express their opinion untill they were actually on their feet, a slip of paper with the name of the subject being then handed to them. The speeches were, however, capitally rendered, and some interesting and instructive points were brought out in the discussions.

London.—A general meeting was held on March 29 at Salisbury House, with an attendance of 90 members, which represents 20 per cent. of the total membership. Mr. H. Davis in the chair having read the report of the Technical Library Committee on its progress, called on Mr. H. Corner to read his paper, entitled "Traffic Evolution." This lecture was fully appreciated by a very interested audience, and a discussion followed, in which the following members joined:—Messrs. J. F. Edmonds, Harvey A. Smith, W. Napier, L. E. Tattersall, J. Stirling, W. Benham, P. Mantle, Misses E. Ralph, A. Mobley and A. Reekie.

A general meeting was held at Salisbury House on April 7, with an attendance of 88 members. Mr. H. Davis, in the chair, having given notice of an alteration to be made in the rules, whereby the subscriptions will be reduced, called on Mr. W. W. Cook (Assistant Engineer-in-Chief) to give his lecture entitled "Mainly about New York." A discussion was entered into, the following members taking part:—Messrs. H. Corner, W. Benham, P. T. Wood, H. Deane, J. F. Edmonds, P. Mantle, J. W. Wilkinson, J. M. Shackleton, F. Gill, J. Stirling and — Book.

Luton.—The sixth meeting was held on March 18, Mr. J. H. Wilson being in the chair. A paper was read by Mr. A. Roberts, Chief Clerk, on "Limited Rate Bookkeeping." Mr. Roberts dealt with this subject in a very able manner, answering numerous questions put to him at the conclusion of the paper.

Newcastle.—The fifth meeting was held on March 18 with Mr. F. W. Gaskins in the chair. The first paper was by Mr. E. T. Payne (Chief Clerk) on "Fee Department Working, Newcastle District." This was illustrated by five diagrams. The second paper was given by Mr. A. Hewitt, Contract Officer, on "Hotel Telephone Service."

Nottingham.—Two papers were read on "Instrument Maintenance" at a meeting held on March 12. A good number of the members of the society were present, and considerable discussion took place. Both papers were illustrated by lantern slides.

On April 2 the subject for discussion was "Overhead Construction." The paper, which had been prepared by Mr. F. Hopps and Foreman T. Townsend, was read by Mr. Hopps, and illustrated by lantern slides. The principal points made were on aerial cable, staying poles and leads. There was a good attendance, and seven participated in the subsequent discussion.

Nottingham Factory.—The eighth meeting took place on March 22, Mr. C. E. Fenton in the chair. Mr. D. Macadie gave his paper on "Early Telephones," illustrated by a large number of excellent slides. After the discussion Mr. Fenton distributed the prizes in connection with the competition papers given by the workshop staff during the session, the prize winners being Messrs. Honick, Linay, Faulkner and Ault in the order named, consolation prizes being given to Messrs. Bardsley, Pinder and Buxton. The opportunity was also taken of presenting Mr. J. E. Stanton with a handsome barometer in recognition of the splendid services he has rendered the society since its formation.

Oldham.—A paper was read on Feb. 25 by Mr. J. L. Hart, Chief Inspector, Ashton-under-Lyne, under the title of "The Birth of a New Subscriber's Line." The paper, beginning with the Contract Department, traced the procedure through the various stages of the wayleave and engineering staff to the Electrical Department, showing the switchroom and testroom apparatus from the indicator to the heat coil strip of a magneto exchange.

Plymouth.—A meeting took place on March 31, when two members of the staff gave papers. The first was given by Mr. R. G. Balls (Instrument Department), entitled "Faults," which was followed by a good discussion. The second paper was by Mr. A. T. J. Williams (Contract Department), which was entitled "Contract Department Experiences," and contained some interesting and amusing details. A discussion followed this paper also. The chair was occupied by Mr. A. R. Wran, Local Manager.

Southern London.—The monthly meeting was held on March 23, when a paper was read by Messrs. Coupland and Howe on "Telegraph Circuits." An interesttng description of the apparatus and work of the Post Office system was given, illustrated by lantern slides.

Swansea Operators.—The sixth and last sessional meeting was held on March 24 at the Docks Exchange Hall, a miscellaneous programme being arranged for the occasion. The chair was occupied by Mr. W. E. Gauntlett, District Manager. A short paper was read by Miss M. Sweeney on the "Society Meetings of the Past Session," after which some interesting remarks were made by the chairman dealing with progress in the district during the past twelve months. Some questions on traffic points were then put to the meeting and an excellent general discussion followed.

Tunbridge Wells.—The fifth and final meeting of the 1908-9 session was held at Ralph's Restaurant on April 13. A very interesting lecture on "Departmental Routine" was given by the vice-president, Mr. A. L. Curling. The District Manager, Mr. S. C. Smith, occupied the chair.

Warrington.—The last meeting of the session was held on March 24, the Provincial Superintendent, Mr. R. Shepherd (president), presiding over an attendance of 63 members and friends. The lecture was given by Mr. Stuart, of the Engineer-in-Chief's staff, London, on "Leading-in Cables," and was illustrated by lantern slides.

Wolverhampton.—A meeting took place on March 19 at the Midland Café, Wolverhampton, the chair being taken by Mr. W. W. Gould. A lecture on "Wireless Telegraphy and Telephony" was given by Mr. A. C. Morris, illustrated by models and diagrams made by himself. A large gathering was present, amongst whom were several of the Birmingham staff.

STAFF GATHERINGS AND SPORTS.

Birmingham.—The "Entee" Entertainment Society gave its first concert and dramatic performance at the Moseley and Balsall Heath Institute on March 30. The first part of the programme was musical, consisting of glees by the choir of about 40 voices, and solos and duets by the members. The rendering of the various items, although not above criticism, showed that there are singers amongst the Birmingham staff of considerable merit. The second part of the programme was entirely dramatic, the play being *Pygmalion and Galatea*, W. S. Gilbert's original mythological comedy. It is not possible to speak too highly of the manner in which the performers sustained their parts. The acting was exceedingly well done and certainly excelled all expectations. There was a large and appreciative audience, and it is hoped the unqualified success achieved by the first attempt of this society will encourage them to continue their efforts, for the talent displayed in both the musical and dramatic art is of no mean order.

Wolverhampton.—A very sucessful whist drive, promoted by the district office staff, was held on March 29 in the Midland Café, Wolverhampton. A gathering of over 50 was present. Songs were rendered by Mr. R. W. Lloyd, and light refreshments were served during the interval. The M.C. was Mr. W. W. Gould, of the district office staff, and the prizes were presented to the winners by the Chief Clerk, Mr. W. S. Kay.

Leicester.—The telephone society held a very successful whist drive at the Oriental Café on Feb. 22.

A football match was played on Good Friday between the "Inside" and "Outside" staffs, resulting in a win for the outside by 2 goals to 1. For the winners E. L. Hague and Meadows played well, and also Bolt, Revitt and Shaw for the losers. P. V. Sansome was referee.

West Kent.—A mutual benevolent society has been formed in the West Kent district with a membership of 120.

Plymouth.—A football match took place on March 20 at Plymouth between the Plymouth and Cornwall staff. The match was keenly contested, the result being a win for Plymouth by 3 goals to 1. In the evening the teams and friends spent a pleasant time at the Mount Pleasant Hotel, where a smoking concert was held. In the unavoidable absence of Mr. Hooper, District Manager (who came in late in the evening), Mr. A. R. Wran, Local Manager, occupied the chair, and a very good programme, which was mostly carried out by the staff, was gone through. The arrangements were carried out by Messrs. Bennett, Walton and Evans, while the Truro team was captained by Mr. W. S. Griffiths.

East Kent.—The annual staff social gathering was held at the Metropole Hotel, Dover, on March 26. The programme consisted of nineteen dances and several songs, rendered by members of the staff and their friends. Among those present were Mr. C. F. Ashby, District Manager, with Mrs. Ashby. Mr. F. Duerth acted as hon. secretary, and Mr. J. U. Wood, district office, ably carried out the duties of M.C.

Brighton.—A whist drive took place at the Pavilion Creamery, Brighton, on March 13, Mr. O. S. Flower acting as secretary and Mr. H. Drury as M.C. There were 112 members of the staff and friends present, the peculiarity of the results being that all the prizes, with one exception, went to non-members of the staff, the exception being Miss Varney, who took the third ladies' prize. Mr. C. F. Moorhouse, the District Manager, and Mrs. Moorhouse were present.

A smoking concert was held at the New England Inn, Brighton, on March 24, the occasion being that of spending one hour propounding knotty problems to Mr. J. Shea, these problems having relation to the outdoor work of the Company's staff. Mr. Shea very lucidly and patiently disposed of all these knotty points to the satisfaction of everybody present, after which a good musical programme was gone through, those contributing to the same being Messrs. F. W. Roberts, O. S. Flower, W. Knight, F. Luetchford and A. Moon, Mr. E. Parsons presiding at the piano. Besides Mr. Shea, Mr. C. F. Moorhouse (District Manager), Mr. F. W. Roberts, Mr. H. Hatton and others were present, while Mr. O. S. Flower, secretary of the telephone society, supervised the arrangements.

Norwich.—On April 8 a successful whist drive was held at the Criterion Restaurant by the Norwich staff and their friends. The number present was 140. Mr. Wigg, Local Manager, won first gents' prize, and Mrs. Wigg won first ladies' prize. The last drive of the season is being held on April 29.

Swansea.—A smoking concert was held at the Adelphi Hotel, Wind Street, on April 23, when an enjoyable evening was spent by a large gathering of the district staff. The chair was occupied by Mr. W. E. Gauntlett, District Manager. An excellent programme, consisting of songs and musical selections, had been arranged, and members of the staff contributed the various items in first-rate style. Advantage was taken of the occasion to present Mr. R. Williamson, Local Manager, who is leaving the district to take up similar duties at Newport, and Mr. H. M. Pope, Assistant Engineer, who has resigned the Company's service to transfer his energies to telephone work in New York, with tokens of esteem. Prizes were also presented to Messrs. W. A. Elliott, J. C. Jenkins and P. S. Taylor for excellent competitive papers read at the last sessional meeting of the telephone society. The presentations were made by Mr. Gauntlett, who was seconded and supported in his remarks by the heads of the various departments.

Dewsbury.—A whist drive and social evening was held by the staff on April 2, the first prizes being won by Mr. T. E. Crosby, Local Manager, and Miss N. Beaumont, Operator. Supper was provided, and the remainder of the evening was harmoniously spent.

Thames Valley.—On March 19 the Thames Valley district staff held a whist drive in the Talbot Café, Reading. The attendance numbered about 160, and included representatives of the Post Office and the Great Western Railway Signal Department. The prizes were presented at the end of the evening by Mrs. Terras, the first prizes going to Miss Stoneham (of the local Post Office staff) and Mr. V. Lane (of the Corporation Tramways Office), respectively. The evening was thoroughly enjoyed, and hopes were expressed that a social function of some kind might become an annual event for the future

On April 17 a football match was played at Oxford between teams representing the Reading and Oxford staffs.

London.—*Avenue Cricket Club.*—The second annual concert was held at Bishopsgate Institute on April 4, under the direction of Mr. F. Saunders, when the following artistes assisted:—Misses Gertrude Berry, Dorothy Berry, Ivy Hatherley, Miriam Jackson and Nora Mitchell, and Messrs. C. Gumbrell, G. Gadsby, T. Mitchell, W. Grisold, G. Killick, A. Young, Leslie Buxton and

"The Daltons." The concert was admitted on all sides to be thoroughly successful. As the club this season have their own ground, it is hoped that the membership will considerably increase. The secretary, Mr. H. J. Henley, 26, Stanmore Road, Leytonstone, will be glad to hear from anyone desirous of joining. Subscription 5s.

London.—The Croydon district staff held a social evening at the Co-operative Hall, Penge, on April 1. A most enjoyable evening was spent by the staff present and their friends. The whole of the arrangements were admirably carried out by Miss K. Pring, Clerk-in-Charge, Sydenham Exchange.

Portsmouth.—On April 3 the annual dinner of the National Company's Portsmouth and district staff was held at the Richmond Hotel, Lake Road. A company numbering about 80, including visitors from neighbouring districts, were present. The chair was taken by Mr. S. J. Smith, District Manager, and one toast only was proposed, namely, that of "The King," the remainder of the evening being devoted to a concert the items of which were contributed by the following:—Messrs. Arnold, Copeland, James, Walker, H. J. Albany, Watson, F. N. Albany, Yates, Welch, Legge, Pharo, Padget, Smitch, Traviss, Rutter, R. Collins, Shannahan and Burgess.

Oldham.—The district office staff held a pleasant evening on March 19 at the Oriental Café. The proceedings commenced with dinner, which was followed by a smoking concert, various members of the staff contributing to the programme.

Hanley.—A football match was played on March 20 between the staffs of the National Telephone Company, Limited, and the Post Office. After an interesting game, which unfortunately had to be stopped fifteen minutes from time, the issue was left in doubt with the score at one all, the game being abandoned owing to the inclement weather.

Warrington.—An enjoyable social function immediately followed the last lecture of the first year's series of meetings in connection with the South-West Lancashire District Telephone Society. The primary desideratum of the organising committee to gratify all participants was almost achieved on March 24, when the majority of the society members and friends assembled at the King's Café. A good programme had been compiled and was highly appreciated. Some exceedingly interesting whist games took place, whilst an attractive concert and dancing were also in progress. Thanks should be extended towards the committee and the following ladies and gentlemen who contributed to the evening's enjoyable programme:—Misses M. Warren and M. Peake; Messrs. T. Taylor, H. Sherrington, F. W. Ashton, W. E. Roscollor, W. Moores and G. Underwood. The Provincial Superintendent (Mr. R. Shepherd) and the District Manager (Mr. H. Chambers) were among those present.

NEWS OF THE STAFF.

Mr. C. REMINGTON, District Manager, Blackburn, has completed 25 years' telephone service. He entered the Lancashire and Cheshire Company in February, 1884, and was transferred to the National Company then operating in Yorkshire and the north in July, 1888. In July, 1892, he was appointed Chief Electrician at Manchester, which position he held until promoted to be District Manager, Blackburn, in September, 1902. During the ten and a half years Mr. Remington was at Manchester many changes occurred. At first the switch and testrooms were in the Manchester Royal Exchange building, and the system was that known as the battery ring-through, in which polarised ring-off indicators were used, and the plant outside was aerial with earth circuit lines. Then followed a very great change; the Company purchased the Portland Street property and decided to transfer the Manchester Central Exchange there. An underground metallic scheme with magneto ringing was arranged, and it was agreed to build flat switchboards with single cords and call wires. Later on this was altered to automatic call and clear with double cords. The transfer to the Post Office of the trunk lines in 1896 was an important event, Manchester being then the largest trunk centre in the country.

Mr. T. J. CLARK, the late Chief Clerk at Manchester, was, on the occasion of his transfer to Norwich, presented by the Manchester staff with a handsome dressing case, suitably inscribed.

Mr. R. H. GILLILAND, Assistant Chief Inspector, Dublin, has been transferred to Belfast in a similar capacity, vice Mr. S. W. MCDOUGALL, who has been appointed Switchroom Manager-in-Training.

Miss M. E. MORROW, Senior Operator, Dublin, has been appointed Chief Operator at Ballsbridge Sub-Exchange.

Miss M. BLAIR, Senior Operator, Dublin, has been promoted to the position of Supervisor.

Chief Inspector F. BRIGG, Ramsgate, on leaving for Canada, was presented with a case of razors, which was subscribed for by every member of the Ramsgate centre, and some amongst the Margate staff.

Mr. R. WILLIAMSON, Local Manager, Swansea, has taken up the duties of Local Manager at Newport.

Mr. W. J. HODGETTS has been appointed Engineer, Swansea.

Mr. H. M. POPE, Assistant Engineer, Swansea, has resigned the Company's service, and sails shortly for New York.

Mr. F. H. PEARCE, Stores Clerk, Swansea, who has left the Company's service for a berth in Canada, was presented on leaving with a case of razors and a travelling rug.

Mr. F. C. STEVENS, Sub-Engineer, Bristol, has been appointed Assistant-Engineer, Swansea.

Mr. W. LEE, Chief Clerk, Oldham, was presented with a pair of Mardi bronzes, contributed to by the district office staff and principal officers in the Oldham district, upon the occasion of his transfer to a similar position at Liverpool.

Mr. J. W. HOBSON, Assistant Engineer, Edinburgh, who has been appointed Engineer for the Dundee district, was entertained to a supper in the Union Hotel, Lothian Road, Edinburgh, on April 9. Mr. D. McIntosh, Engineer, occupied the chair, and Mr. J. D. W. Stewart, District Manager, was present. A very interesting and enjoyable programme was gone through.

Mr C. M. FFRENCH, Local Manager, Barnstaple, has been transferred to a similar position at Stroud.

Miss ELSIE H. HEAPS, Senior Operator, Exeter Exchange, has been appointed Travelling Supervisor for Exeter district.

Miss MINNIE CATHERINE JENKIN has been appointed Travelling Supervisor in the Edinburgh district.

Miss MARGARET WILKIE has been appointed Travelling Supervisor in the Mid Lanark district.

Mr. S. FIRTH, Provincial Service Inspector, has been appointed Engineer, Nottingham, vice Mr. J. A. BONATHAN, transferred to the Provincial Superintendent's office at Birmingham.

Miss EDITH FLEET, Supervisor, Nottingham, has been promoted to be Travelling Supervisor.

Miss E. FORD has been promoted from Senior Operator to Supervisor, Nottingham.

Miss MARGARET BARR, Cashier, Leicester, has been transferred to Nottingham in a similar capacity; she was presented with a gold watch by the staff.

Mr. ALEXANDER LUMSDEN, Exchange Manager, Edinburgh Central, has been graded as Traffic Manager.

Mr. JAMES CAVERS, Local Manager, Elgin, on the occasion of his leaving the Company's service for Canada, was presented with a handsome gold chain and pendant from the members of his staff. The presentation was made by Inspector Dow, who conveyed to Mr. Cavers the best wishes of the staff for his future success in his new sphere of life.

Mr. B. W. FLETCHER, Inspector, Dover, has been transferred to Ramsgate as Chief Inspector. On his leaving Dover, he was presented by the district office and local office staff with a fitted dressing case.

Mr. E. STANLEY BYNG, Sheffield, has been transferred from Student Member to Associate Member of the Institution of Electrical Engineers.

Mr. E. J. JOHNSON, Sheffield, Exchange Manager, has been appointed Traffic Manager, Sheffield district.

Mr. S. R. VAUGHAN, Nottingham, has been appointed Exchange Manager, Sheffield.

Miss DORA JACKSON, Senior Operator, Sheffield, has resigned in order to accompany her parents to America. She was presented with a signet ring and a purse.

Mr. S. MCFADDEN, Observation Clerk, Manchester, has been promoted to be Exchange Manager, Central Exchange, Manchester.

Mr. R. HILL, Assistant Exchange Manager, Central Exchange, Manchester, has been promoted to be Exchange Manager at the new City Exchange, Manchester.

Miss M. REILY, Assistant Clerk-in-Charge, Central Exchange, Manchester, has been promoted to be Clerk-in-Charge, City Exchange, Manchester.

Miss K. FROST, Monitor, Central Exchange, Manchester, has been promoted to be Assistant Clerk-in-Charge, Central Exchange, Manchester.

Miss L. T. ORR, Night Supervisor, Central, Exchange, Manchester, has been promoted to be Night Clerk-in-Charge, City Exchange, Manchester.

Mr. H. M. KENWORTHY, Fault Clerk, Swansea, has been transferred to Dublin as Assistant Chief Electrician.

Miss CHRISTINA MILLER, Chief Operator, Alloa Exchange, left the Company's service on March 25 to enter the nursing profession. She was the recipient of a handsome travelling bag from the members of the Stirling District Staff.

Miss ANNIE TURNER, Supervisor, Wolverhampton, has been appointed Travelling Supervisor for the North Midland district.

Miss L. LAWRENCE, Senior Operator, Wolverhampton, has been appointed Supervisor.

Metropolitan Traffic Department.—*Promotions and Transfers*:

Miss DOROTHY MANNERING, Operator, London Wall, has been promoted to be Supervisor, Holborn.

Miss DAISY KENNEDY, Operator, East, has been promoted to be Supervisor, London Wall. She was presented by her colleagues with a gold pendant.

Miss KATHERINE DALE, Operator, Sydenham, has been promoted to be Supervisor, Gerrard.

Miss MAUDE HORTON, Supervisor, Hop, has been transferred as Supervisor to the Operating School.

Miss KATE HORTON, Operator, Holborn, has been promoted to be Supervisor, Hop.

Miss LILIAN BAILEY, on her transfer to the Operating School as Supervisor, was presented by the Westminster staff with a beautifully bound volume of Mrs. Browning's Poems.

Miss MURIEL HARRISON, who recently resigned to take up another position, was given a wrist bag by her late colleagues.

MARRIAGES.

Miss M. KELLS, Post Office Fee Clerk, Cork, has resigned in view of her marriage to Mr. R. SURPLICE, Chief Clerk. The resignation and approaching marriage were made the occasion of a presentation from the staff of the South of Ireland district, in which the Superintendent for Ireland and the Metropolitan Engineer joined. The presentation, which took the form of a purse of sovereigns, was made on April 7 by the District Manager (Mr. A. M. Kidd) in the presence of a large number of the staff.

Mr. C. GILLMAN, Inspector-in-Charge, Uxbridge, was recently married to Miss B. WILLIAMS, niece of Mr. J. A. Bonathan.

Miss JESSIE EVANS, Senior Operator, Sheffield, has resigned her position to be married. The operators have presented her with a double jam dish and spoons.

Miss L. FOX, Operator, Dewsbury, was presented with silver flower vases, fruit dish and sugar sifter on the occasion of her resigning to get married, after

seven years' service. The presentation was made by the Local Manager, Mr. T. E. Crosby.

Miss N. M. ROSE, Cashier, Nottingham district office, has resigned in order to be married, after seven years' service with the Company. She was presented with a silver cake dish and knife by the Nottingham district staff as a mark of their esteem. The presentation was made on March 20 by Mr. Sibley, who wished Miss Rose success in her future life.

Miss ETTIE LANE, Portsmouth, who is leaving to married, was presented on April 8 with a silver cruet and sugar sifter by the operating staff.

Mr. L. CUNDY, of the Table Set Department, Notts Factory, was presented by that department with a handsome set of carvers and a pair of gloves on the occasion of his marriage on April 11.

Leaving to be Married.—*Metropolitan Traffic Staff:*

Miss ANNIE FRASER, Supervisor, Operating School, who resigned after ten years' service on March 25, was presented by the school staff with a preserve dish, spoon and butter knife.

Miss ELEANOR LEATHERDALE, Supervisor, London Wall, resigned on April 17, and after her marriage will be taking up residence at Tsingtan, North China. She was presented by her colleagues at London Wall with a handsome gold bracelet.

Miss ETHEL RUDLEN, on leaving East Exchange, was presented with a picture.

Miss HARRIETT MASON, leaving the same exchange, was presented with a pair of vases and specimen glasses.

OBITUARY.

It is with regret that we have to report the death of Miss E. B. SADLEIR, Clerk, Measured Rate Department, Birmingham district office, who died on April 13 from pneumonia after a short illness of one week only. A wreath was sent by the members of the district office staff as a token of respect to their late colleague. Wreaths were also sent by the Contract Department, and by the operators at the Central and Midland Exchanges.

On March 28 Mr. FRANK ASKEW'S seventeen years' of faithful service with the Company was abruptly terminated after a very short but painful illness, by death, at the Southall Exchange premises, where he acted as Resident Operator.

MR. F. ASKEW.

Mr. Askew was born at Kennington in July, 1875. He entered the service of the Western Counties Telephone Company at Portsmouth, as an Instrument Inspector in 1892, and after spending five years at Portsmouth and Canterbury, obtained a transfer to the Metropolitan area and was centred in the Western district up to the time of his death. His early London experience was with the Electrophone Department at Gerrard Street, and thereafter he was successively Switchroom Manager at Kensington, Gerrard and Paddington. Upon the Metropolitan centralisation scheme taking effect in January, 1905, Mr. Askew took up position of Chief Inspector at Kensington, which position he held up to the last. The high esteem in which he was held by all sections of the staff was forcibly demonstrated by the representative gathering at the graveside in Southall Cemetery on April 12. The coffin—which was covered with wreaths from relatives, colleagues, and the Royal Engineers' Territorial Section (of which deceased was a member)—was carried to the grave and laid at rest by six of his old colleagues, Messrs. Randell, Milne, Martin, Herbert, Stowell and Soper. Very touching tributes testifying to the esteem in which Mr. Askew was held by his superiors were received by the widow from Mr. Clay, Metropolitan Superintendent, and Mr. G. F. Greenham, Metropolitan Electrician.

FOR "URGENT REPAIR AND RETURN."

BY C. E. FENTON.

THE minds of the Nottingham Factory staff are at times greatly exercised as to the method of dealing with the miscellaneous collection of articles received for repair, but the difficulty has its amusing side as may be seen from the following:—

A short time ago a parcel was received bearing an "Urgent Repair and Return" label from one of the centres, and when examined, it proved to be two bottles of "home-made wine," but of what brand is not clear, as all the staff suddenly turned teetotal.

The smile this incident provoked had scarcely passed away when another parcel labelled for "Urgent Repair and Return" came to hand, and upon being opened was found to contain a macaroon biscuit of a most appetising appearance. It was, however, undesirable to violate the Factory Act, which prohibits "meals" in workshops.

Of course, the explanation is simple enough, the "Urgent Repair and Return" tie-on labels had become detached from the original parcels in transit, and the carriers in their endeavour to straighten matters had attached the labels to other parcels on hand, from which labels had presumably become detached, and in each instance they missed fire.

The above incidents have their practical side, as they show in a marked manner the necessity of having an adhesive label in addition to the tie-on label.

NATIONAL TELEPHONE PROGRESS.

DURING the past month exchanges were opened at Duns (Berwickshire) in the Border district and in Manchester (City Exchange) in the Manchester district; 2,512 new stations were added during March, bringing the total at the end of that month to 482,389.

Glasgow.—The new central battery exchange to serve the Hillhead and Partick area was opened on Saturday, April 17, when all the subscribers (about 3,200 in number) were successfully transferred from the old to the new premises. The new building which has been erected by the Company is of fireproof construction throughout and is situate at the corner of Highburgh Road and Caledon Street. It is interesting to note that the building has been erected and the equipment installed within a period of twelve months.

Nottingham.—The reconstruction work and additional equipment on the Nottingham Central Exchange central battery switchboard is now approaching completion, the subscribers' capacity having been increased from 3,200 to 5,200 lines, and the multiple capacity to 5,800 lines. Considerable alterations have been made to the power plant, a new motor generator having been equipped replacing a 4½ horse-power gas engine and motor. A desiccator has also been fitted. These alterations have been made in conjunction with the additions to the existing premises, the testroom capacity having been considerably increased by transferring the operators' quarters to a new part of the building.

Ilkeston Sub-Exchange.—The equipment at this exchange has just been increased from 100 to 200 line boards.

INSTITUTE OF ELECTRICAL ENGINEERS.

THE following members of the Engineer-in-Chief's Department have been elected to the Institution of Electrical Engineers:—Messrs. G. M. Maddock, C. T. Peacock and J. W. O. Sandell as Associate Members, and Mr. S. H. Pook as Student.

Among the nominations for Council for the ensuing year appears the name of Mr. W. W. Cook.

Mr. Cook's work is known to all the staff, and we congratulate him on the honour, feeling sure that the Institution makes a thoroughly sound nomination.

NOTES ON STAYING POLES.

COLUMN No. 1 of the table given on page 7 of our last issue

should read Height
Spread

THE LIFE-SAVING TELEPHONE.

AN accident, exemplifying in a remarkable manner the value of telephonic communication, occurred at the residence of Mr. S. Whiteley, The Shrubberies, Pool, Yorkshire, last week. Whilst Mr. Whiteley, who is an invalid, was left alone in the house for a few minutes, the chain of a hanging oil lamp in the room broke, and the lamp crashed on the floor, and burst into flame. Mr. Whiteley was helpless, and would certainly have been burnt to death, had he not thought of the telephone, which was fitted on the wall beside him, and connected to the Co.'s Arthington Exchange. The operator at the exchange, on receiving the message, telephoned to Dr. Spray (Mr. Whiteley's neighbour) and advised him of the state of affairs. Dr. Spray, who fortunately happened to be at home, hastened to his neighbour's assistance. He found the room well alight, but with the aid of a passer-by managed to extinguish the flames.

FOOTBALL REPORTING IN JERSEY.

EVEN in Jersey the result of a final tie necessitates special reporting arrangements, and the *Evening Post* containing a full report of the match was obtainable by the spectators as they returned from the ground.

"Needless to say," says the *Evening Post*, "the success of our arrangements could not be assured without the hearty co-operation of the telephone company, and our warmest thanks are due to Mr. Howard Eady, the genial manager, for his personal interest in the scheme. The arrangements made by the telephone company were perfect, and the success of the scheme reflects the highest credit on the employees of the company. We can safely say that our achievement yesterday was a record in Channel Island journalism, and our readers evidently appreciated our enterprise, judging by the fact that our issue yesterday reached 7,180."

THE
National Telephone Journal

VOL. IV. JUNE, 1909. No. 39

TELEPHONE MEN.

XXXVII.—JOHN MILNER SHACKLETON.

JOHN MILNER SHACKLETON was born at Griesemount, Ballitore, co. Kildare, in 1874. He is therefore an Irishman by birth, but the Shackletons originally came from Yorkshire and settled in Ireland 200 years ago.

Mr. Shackleton went first to the Newtown School at Waterford and afterwards to the Sidcot School near Weston-super-Mare, where science was made a strong point in the curriculum.

After leaving school he was apprenticed to a firm of electrical and general engineers in Dublin and there acquired a good knowledge of electric lighting and steam and gas-engine work.

During his apprenticeship he supplemented his training by studying at evening classes.

Mr. Shackleton entered the Company's service in Dublin in December, 1895, when between 21 and 22 years of age, acting as an Inspector in the Instrument Department, and in 1897 was made Chief Inspector. In 1898 when the system was transferred underground, although he had no previous experience of such work, Mr. Shackleton was selected to take charge of it, and amply justified the belief in his capabilities that such a choice implied. He was promoted to be Local Manager at Belfast, 1901, and District Manager at Cork, 1902. In 1905 he was transferred to the Engineer-in-Chief's Department, and was placed with Mr. Watts at Manchester, under whom he obtained much valuable experience. In August, 1905, he was transferred from Manchester to London with the Lines Department, and in January, 1909, he was appointed Metropolitan Engineer.

It will be seen from the foregoing that he has had a varied experience of the Company's business, and should by now have acquired some knowledge of men and things. He has taken a great interest in the telephone societies, at which he has been a frequent speaker. He toured the country in 1906-7 with a paper on "Economic Construction," and again in 1908-9 with a paper entitled "Notes on Engineering."

During the years Mr. Shackleton was at Head Office he was entrusted with work of a highly responsible nature, and enjoyed to a marked degree the confidence and regard of his chiefs and colleagues. Although his appointment in London was quite recent, there are already signs that he is likely to achieve a great success as the head of a large and important staff.

Mr. Shackleton states that he has thoroughly enjoyed himself both in and out of business wherever he has been, and attributes this in a great measure to good health. He is a believer of plenty of exercise and temperate diet.

Of a genial presence and possessing a ready wit, he has many friends in the provinces, and is always a welcome guest at any staff gatherings.

His principal amusements and recreations whilst in Ireland were fishing and shooting and he was a member of rifle clubs both in Dublin and Cork. He is fond of an open air life, and shooting and fishing being difficult to obtain in London he has taken to golf. He has, moreover, a penchant for gardening. Mr. Shackleton is interested in all kinds of literature outside engineering studies, but owns to a preference for standard authors such as Dickens and Thackeray over the more modern school of fiction.

HEAD OFFICE STORES DEPARTMENT.*

STORES.—STATIONERY.—TELEPHONE DIRECTORY.

By C. W. SALMON.

FIRST of all, I would like to say how pleased I am to become acquainted with this society, which is doing such a good work, not only in promoting social intercourse amongst the members of the various staffs in the Company's service in this district, but in dealing with the many problems connected with the Company's work in such a way as to render the everyday duties of such staffs more interesting than they otherwise would become; for it goes without saying that the more interest one is able to take in one's duties, not only will the allotted work be better performed, but the amount of pleasure derivable from the carrying out of that work will be infinitely greater than if it were conducted in a merely perfunctory manner. It is interesting to note, as recorded from time to time in the TELEPHONE JOURNAL, how this desirable interest has been awakened by societies such as this which have been formed throughout the various parts of the kingdom and which are proving so eminently successful.

I must confess that when I received a letter from your secretary asking me, on behalf of your committee, if I would read a paper describing the work of the Head Office Stores Department, I could not help feeling that any remarks I might have to offer on this subject would possibly be of such a prosaic character as to render them hardly sufficiently interesting to justify the expenditure of your time in attending to listen to them; but as your secretary said in his letter "Not only would it be interesting, but specially interesting, seeing that there is hardly a member of the staff who is not in some way affected by your work, and it should, I think, be beneficial in the office dealings," I felt that after all a cursory survey of some of the methods employed by, and the work done in the department might possibly prove of some value to you; and so here I am, to lay before you a few remarks on this topic which, I trust, may be of service to each and all of those assembled together in this evening's meeting, and I evince a hope that the information so imparted will enable you to obtain a clearer conception than hitherto of the reasons which prompt various of the instructions which come from Head Office in relation to matters connected with stores used by the Company.

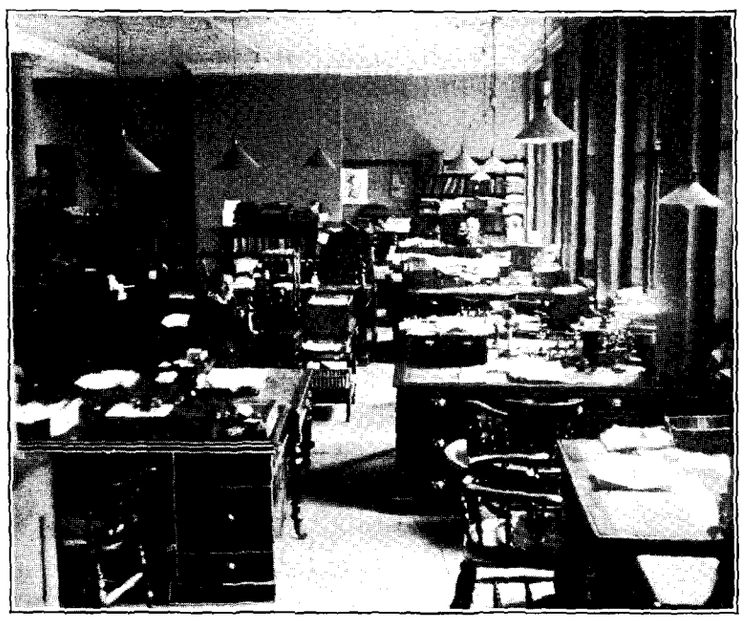


FIG. 1.

A portion of the Stores and Stationery Offices, Telephone House, Victoria Embankment.

The system which at present is in force is one, as may be surmised, which has been the outcome of many years' experience, and has been built up from small beginnings. When I entered the service of the United Telephone Company, now over 26 years ago, in order to take charge of the Head Office Stores Department—a position I have had the honour to occupy ever since—that company was the parent concern and held the patent rights for all transmitters and receivers—those two little articles which constitute as it were the foundation stones upon which the immense business of the great Company which we serve is built up. These were used only by the United Company itself, and by what were then known as its subsidiary companies, which extended over various parts of the kingdom; and I well remember the jealous care with which these instruments were guarded; every one was numbered and its location carefully posted up in a register, so that its whereabouts could at any time be ascertained. Of course as the years went on these patents ran out, and now anyone may buy whatever description of telephone he may care to select. The United Company worked the Metropolis only, and the value of the stores purchased for its requirements was, as you can imagine, quite an insignificant affair when contrasted with that of those purchased by our Company during recent years.

The part played by the department in actual storekeeping is quite infinitesimal as compared with its other duties. By far the greater portion of its work is in connection with stores which are held by the contractors and delivered to the centres direct from their works, the number of firms dealt with

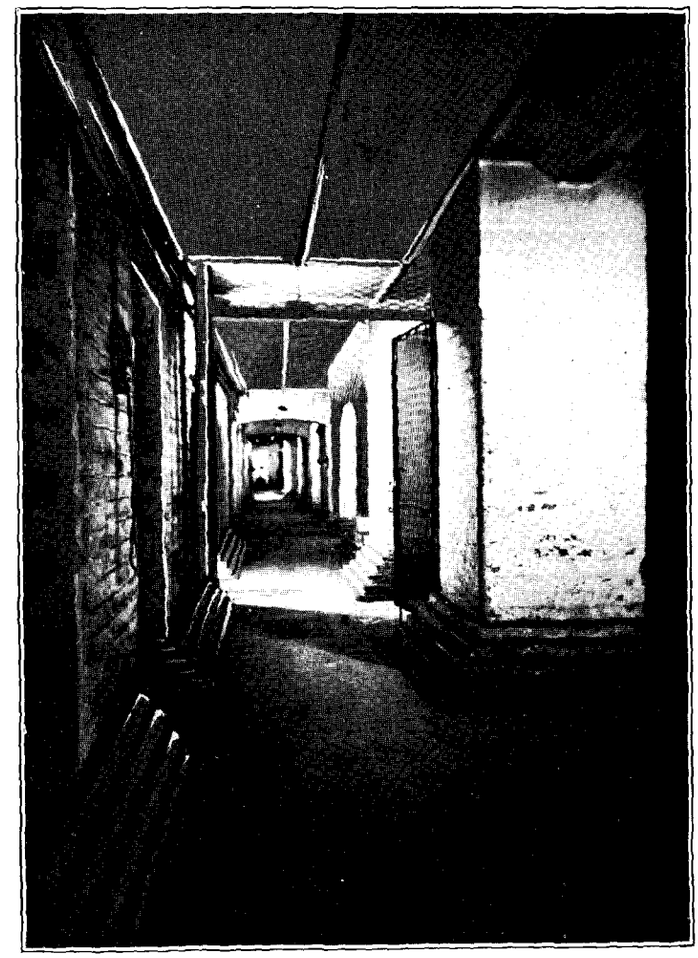


FIG. 2.

Corridor in sub-basement of Telephone House, Victoria Embankment. The sub-basement is devoted to the storing of articles which are examined at Head Office, and also emergency stocks.

by the Stores division alone amounting to over 2,000 (this figure not including those with whom the Stationery and Printing division has relations). The stores in its immediate custody consist of those located in Telephone House, and the stationery and printing in the same building; it also deals with the stocks of cement blocks at Nuneaton, and last but not least with the stocks of creosoted poles lying at the several depôts distributed over different parts of the east and west coasts of England and Scotland.

Practically every article used throughout the service is purchased and supplied through the department, from the humble paper fastener, by means of which you are able to secure together your various documents, to those wonderful and skilfully constructed and equipped switchboards which are installed throughout the country, and by whose agency it is possible for those teeming millions of messages to be constantly darting, as it were, from point to point with a directness and swiftness which constitutes one of the marvels of a marvellous age. Of course, between these two extremes is marshalled the long array of stores stock articles, those listed in the schedule of stationery and printing, together with the innumerable non-stock articles which do not come under either of these headings, including furniture, underground work, and work connected with additions, alterations, repairs and redecorations to premises occupied by the Company, typewriters, bicycles, etc., not forgetting that leviathan publication, the Telephone Directory, which is now issued complete every six months, and which taxes very considerably not only the resources of the special staff which is constantly engaged in dealing with its ramifications, but calls forth all the energies of a great firm of printers, who find it one of the most complicated and stupendous pieces of work it has been their lot to grapple with.

In the limited time which lies at my disposal to-night it would be futile for me to attempt to describe adequately all the numerous methods adopted in

* Paper read before the Bristol Telephone Society.

dealing with the stores, and I can only sketch out in very general terms a few of the principal lines on which the business is conducted.

In the first place it may interest you to know where the department is housed. The clerical staff is located in the second floor in Telephone House, the stationery depôt is situated at one end of the basement in the same building, the other end of that floor being occupied by the printing office, while the sub-basement is reserved for the stores depôt.

The department is composed of two main divisions:

1. Stores;
2. Stationery, Printing and Telephone Directory;

a chief assistant being attached to each division.

I.—STORES.

This division is divided into sections, over each of which is placed a senior clerk provided with his necessary assistants, the various sections dealing with the following:—

1. Contracts for stock articles and matters relating to deliveries.
2. Dry-core cable and general examination of orders.
3. Creosoted wood poles, oak arms, cast-iron pipes, cement blocks and empt es.
4. Switchboards.
5. Non-stock articles.
6. Subscribers' wall and table sets, articles for sale outright and sale of scrap material.
7. Articles not dealt with by the sections above mentioned.
8. Stores depôt.

In addition to these sections there is, of course, the staff for the filing of correspondence and despatch of letters, orders, etc. The various stages of the departmental work may be divided under two headings: (1) arrangements for the manufacture and stocking of supplies, and (2) methods adopted for distribution of them as and when required by the various centres.

Under the first heading a large amount of work is involved, because, long before the year in which the articles are wanted is ushered in, arrangements have to be started in respect of the various contracts that require to be entered into. Thousands of tender forms for about 2,000 articles have to be filled up with certain particulars and sent out, patterns have to be carefully inspected by those firms desiring to do so, and when the tenders are eventually sent in, scheduled up and duly accepted, then the work of issuing samples to the successful competitors has to be proceeded with, as it is incumbent upon the manufacturers to send in, and have approved, patterns made up by them in every way equal to those to which they quoted before they are permitted to make general deliveries. Tenders are only invited from those firms who the Company feels confident will be able to carry out satisfactorily any contracts that may be entrusted to them, and, it being the Company's practice to purchase the best article of its kind, it is careful to see that it gets that article made out of the correct material and manufactured in every respect in strict accordance with its specification, not only mechanically, but, where it calls for it, electrically; and, as in many instances the suppliers' samples have to be returned over and over again before they can be passed, incessant watchfulness has to be observed to ensure the right article being submitted in ample time to permit of the contractors commencing manufacture and accumulating the necessary stocks, in order to enable him to execute orders right away on receipt of same, as it is most essential that good supplies on account of the new contracts should be in existence before those off the previous contracts are exhausted. You can readily understand that there are occasions when, as sometimes happens, the stocks off the old contracts have come to an end and, owing to unexpected difficulties cropping up with regard to manufacture off the new contract, there are none available, what I may describe as "anxious moments" are experienced; for it is quite recognised that in order for you to keep stocks low you should be able to rely on requisitions being promptly met, and it is the one great aim and ambition of the department to be in a position at all times to supply immediately on demand every article that is mentioned on the list of stock articles for which a contract has been made. To the attainment of this object all the facilities obtainable from the use of an up-to-date system, together with the unflagging energies of an efficient and enthusiastic staff, are constantly directed, and although just the same desire extends equally to those items not included in the category just referred to, it is unfortunately next to impossible, except in a few solitary instances, to ensure similar expedition in delivery, as so many obstacles continually arise to cause delays, and in some cases very protracted ones.

The contracts are mostly made at a given price for the requirements of the Company for the whole of the year, but there are several classes of material for which what are called "quantity contracts" are made, that is to say, the Company undertakes to accept delivery of definite quantities within certain periods, and the probable requirements of these goods consequently have to be carefully gauged up before these contracts are entered into.

POLES.

For instance, in the case of creosoted wood poles it is necessary for these to be purchased long before they are wanted for use, as they have to be felled within certain months of the year, then to be brought over from abroad and stacked in order to dry, be dressed and properly prepared for creosoting; and although certain dates are stipulated for in the contracts, it does not do to rely implicitly on them, as many unforeseen causes arise to render it impossible for the poles to be ready within the prescribed time, and unexpected difficulties are sometimes encountered by the shippers after the poles have been cut down. In one year I recall, the position was becoming somewhat acute, as poles were much behindhand in coming over. The reason assigned was that owing to the mild winter and absence of snow they could not be engineered along the route which they had to traverse without great expense and considerable delay, it being the practice to drag them sledge fashion for many miles over the snow from the forests down to the port of shipment. Then again, even when the poles are safely imported in the time agreed upon, it often happens that through unfavourable weather they will not dry sufficiently to enable them to be creosoted, and if the bad weather is prolonged the work of creosoting cannot be got on with, and as it would of course never do to be without supplies of such articles, it is necessary always to hold ample stocks in hand to provide against these contingencies, and to purchase forward one or two years ahead.

OAK ARMS.

"Quantity" contracts are also made for oak arms, and as these have to be of thoroughly well-seasoned oak, it is necessary to give the contractors plenty of time after the contract has been placed to get in their oak and let it season before they begin to make up the finished article. After the arms have been passed as regards suitability of timber and correctness of make, they have to be painted, and are then put into stock to await forwarding instructions. The yards in which they are stocked are situated on the east and west coasts, also in the Midland counties. As soon as poles are creosoted, and arms are painted, they are paid for by the Company and thereupon become its property.

WIRE.

Similar contracts are made for bronze and copper wire, and that is the reason you will sometimes get during the year, after the printed list of the stock article has been issued, a notice to alter the rate per lb. where the fluctuations in the prices of such materials warrant it.

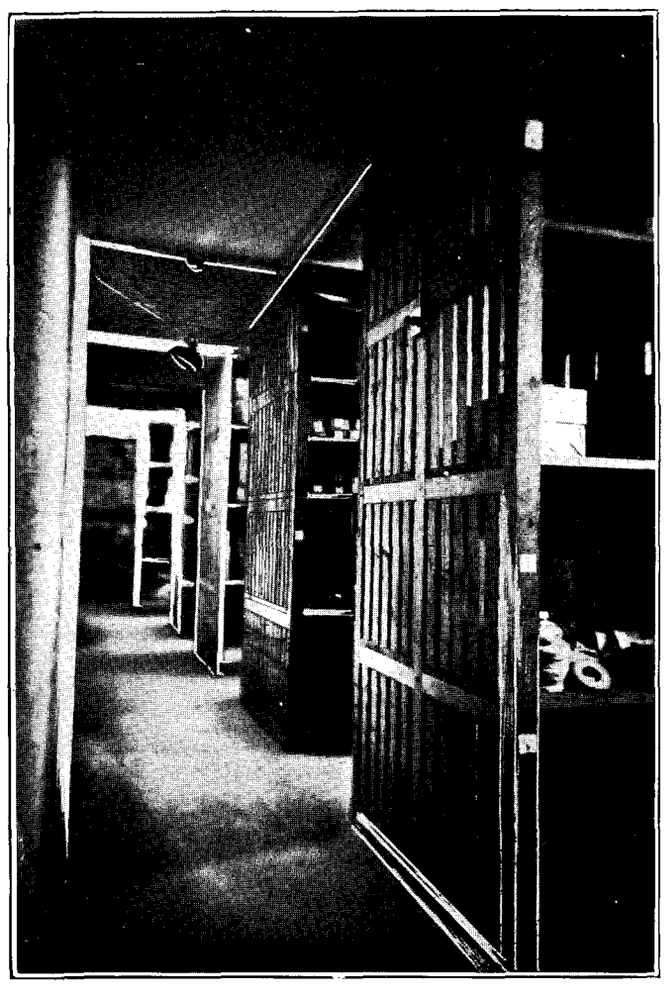


FIG. 3.

A view of some of the bins in the sub-basement of Telephone House, Victoria Embankment.

These quantity contracts are not necessarily made at the commencement of any year, but as and when it is deemed desirable. All contracts are passed by the Board before they are accepted.

PERMANENT STOCK ORDERS.

While the patterns, etc., submitted are being examined, preparations are also being made with regard to the getting together of stocks, and notices are sent out to the various contractors instructing them to make up certain supplies of goods, the quantities of which are decided upon according to the estimated needs of the service, and arranging, when deliveries are made out of same, to replace at once with a similar quantity. These are known as "permanent stock orders," and contain the condition that the quantity mentioned on such orders, unless notification is given to the contrary—should be on hand at the end of the year, and this the Company undertakes to accept delivery of within a certain period in the next year. In this way you will see a nucleus is provided which can be drawn upon while the articles on the new contracts are being prepared. By these means we are able to dispense both with the labour of constantly ordering fresh supplies to be put in hand, also with the keeping of numerous ledger accounts

of goods ordered to be made and those requisitioned off them, as the replacements should take place automatically, and it is therefore only with respect to the "quantity contracts" that such accounts are necessary. A review of the requirements of the service has constantly to be made, so that the quantities mentioned in the "permanent stock orders" can either be increased or diminished as the case may be, and where "quantity contracts" are running low, fresh contracts arranged for. Most of the stores have to be passed as satisfactory before they are allowed to be delivered to the centres, the examination with some few exceptions being carried out by the staff of the Engineer-in-Chief. With regard to those not examined before they are despatched, samples out of deliveries which have been made at different centres are sent up to Head Office from time to time, and in the event of any being found unsatisfactory the matter is taken up with the suppliers, and all centres are notified of the fault and requested to examine carefully similar goods in their possession from the same firm for such defects.

The inspection of such articles as bronze, copper, iron and other wires, dry-core and other cables, instruments, etc., takes place at the works where the goods are manufactured, but there are certain articles which it is considered advisable to test at headquarters, and these are therefore all delivered to Telephone House stores depôt. The sub-basement in which this depôt is situated is conveniently fitted up with bins and cupboards, etc., and is capable of stocking a good quantity of stuff. The goods on arrival are first of all received in the test room, which is in the basement of the building, from whence after being examined they are taken down to the sub-basement; those which are correct being placed in the receptacles allotted to them, while those rejected are stored in another part of the floor to await return.

FIG. 4.
The goods entrance to Telephone House, Victoria Embankment.

EMERGENCY STOCKS.

In addition to these stores there is contained in this depôt the emergency stocks, so that in cases of fire, etc., consignments of material can be sent off with the utmost despatch, and in the winter months special quantities of certain classes of goods are also housed here to provide against sudden demands in cases of breakdowns through snowstorms or other unfortunate visitations. These are, however, issued for ordinary use as soon as the season in which these dangers are mostly to be apprehended has passed. Emergency quantities are also kept at various of the suppliers' works during the winter months. Some large switchboards of certain classes are also kept in stock by the Nottingham Factory. These are all packed up ready in cases, each one marked with a distinctive number, particulars of the contents of which kept at Head Office, so that when required it is only necessary to telephone or telegraph for any given case number to be despatched.

Here may I digress for a few moments, just to give you a few particulars of the system we have adopted with regard to the calling out of the staff after hours for emergency purposes. A list of each one's respective name and address is deposited at a central office of the District Messengers Company, and it is understood with them that as soon as they receive a telephone or other message intimating that the attendance of the staff is required at Head Office they will telephone through to those of their stations nearest to the various addresses and despatch messengers accordingly, with the result that within a very short time those who have been summoned are duly assembled and engaged in the carrying out of the necessary work for the forwarding of supplies.

Further, we have an agreement with the carriers to send in immediately on receipt of instructions at any time, including nights and Sundays, whatever vans may be needed to convey goods to the railway stations. Some time ago the staff were called out in connection with the Glasgow fire and were busy throughout Saturday and Sunday sending away the stores that were being so anxiously awaited in that distant city. On a further occasion when a breakdown occurred through a severe snowstorm in another centre, also situated in the north, an urgent appeal came after hours for a supply of wire to enable interrupted communication to be restored, and great trouble was experienced in getting vans to cart the material to the railway station as the roads in the City were badly frozen over and had become like sheets of ice, rendering them almost impassable for vehicular traffic. However, the difficulty was eventually overcome, and the wire taken to the station, despatched by passenger train, and fortunately arrived at its destination just in time to prevent the gangs being stopped for want of the necessary material. It is at these junctures that one finds, more than ever, what an inestimable boon the telephone service is, as throughout the night telephone conversations to distant towns enable one to make all sorts of arrangements which otherwise it would be quite impossible to make. I may here mention that material cannot be sent by goods train from London after 6.30 p.m. for northern lines and 7.30 p.m. for southern lines, and on Saturdays after 2.30 and 3.30 p.m. respectively. On Sundays, however, goods are not accepted for these trains.

EXAMINATION OF STORES.

But to return to the question of examination of goods, I would again refer to creosoted poles. These are examined after they have been dressed and prepared for creosoting, but are not allowed to go into the tank to be creosoted unless they are considered dry enough to undergo the process. They are watched by the Company's inspector when they are put into the tank and also when they are taken out, and further, he satisfies himself that they have received an injection of the quantity of oil provided for in the specification under which they were purchased. They are then stacked in their respective lengths in the yard, close to the rails which run into all the pole depôts where the Company's poles are located, so that they can be easily put on trucks and sent off as and when required. We have a number of these depôts dotted over the country, in order that the cost of carriage to the districts, which is considerable, can be minimised as far as possible. They are situated at points on the east and west coasts of England and Scotland, those on the east coast being Leven (Scotland), North Shields, Hull, Grimsby and Grays, and on the west coast, Ardrossan, Troon (both in Scotland), Fleetwood, Birkenhead and Newport (Monmouthshire). Therefore, when poles are required for a certain town they are ordered from the nearest depôt. Now and then, however, this cannot be done, owing to certain sizes not being for various reasons in stock in such depôt, and consequently the requirements have to be met from the nearest one at which they are available.

(To be concluded.)

SOME NOTES AND SUGGESTIONS IN CONNECTION WITH TELEPHONE SOCIETIES.

BY B. S. COHEN, *Engineer-in-Chief's Department.*

SINCE the inauguration of our telephone societies the writer has had the pleasure of attending many of the meetings and of reading papers on about twenty occasions. Many little happenings, humorous and otherwise, occur to him, which bring up points that may be helpful to those who conduct these meetings, or who contribute papers.

That these societies are of inestimable advantage, both to the Company and the staff, is, I think, universally accepted.

That the net value of any particular society varies with the method of its conducting will also be fairly obvious. Judicious selection of papers covering all the varied subjects with which an operating telephone company deals is all-important, and it is quite clear that a good alternation of engineering, electrical, traffic and clerical matters is necessary.

For the purposes of this article it is unnecessary to classify papers under the headings of the subjects dealt with, this is quite immaterial From the point of view of this article papers fall into one of the following three divisions:—

(*a*) Concise and explanatory.
(*b*) Statistical and numerical.
(*c*) Oratorical or verbose.

To write an (*a*) quality paper should be the aim of every prospective contributor. Needless to say, the possession of a great deal of information on any particular subject does not by any means render a man capable of imparting that information in a clear and precise manner. As a matter of fact, the expert is probably the worst offender. Let me give as an instance a little story relating to that great and venerated leader in scientific things, Lord Kelvin.

From the very vastness of his knowledge he was apt, when lecturing at Glasgow University, to stray somewhat from the particular subject with which he was supposed to be dealing, and many of his less brilliant students, whilst esteeming the privilege of attending his lectures, felt a certain amount of relief when, owing to his absence, the class was taken by one of his assistants.

At one time Professor Thomson, as he then was, had to attend at Buckingham Palace to receive the honour of knighthood, and in his absence his classes went along merrily, if somewhat prosaically. When his return was announced a wag amongst his students wrote

on a blackboard the following quotation:—"Work while it is yet day for the (k)night cometh when no man can work."

Some years ago it was the practice at a certain technical college to hold a weekly class in *précis* writing, and the value of this knowledge when applied to report writing is incalculable. In the same way a class in *précis* talking would be invaluable.

Coming now to class (*b*), the statistical and numerical papers. Many of our subjects can only be dealt with by the aid of quantities in or out of tables and by curves. In nearly all such cases, however, these curves and tables are only the raw material by the aid of which the finished products, in the form of a law, proposal or definition, can be formulated.

In such cases it is to my mind essential to dwell on the finished products and touch very lightly indeed on the raw material.

This, of course, particularly applies to our society meetings, where the curves and tables once thrown on the lantern screen are probably never seen again by the majority of the assembly.

In any case the enumeration of such soulless figures as detailed dimensions of apparatus, which neither "adorn a tale or point a moral," should be rigidly excluded.

Coming to the last class (*c*), the oratorical or verbose. I think most of us will agree that whilst possibly suitable for a school of elocution we have no use for such papers at our telephone meetings. Most of us have had the doubtful privilege of listening for many weary minutes to a speaker who in the course of a long and, let us hope, useful life has accumulated a little (very little) practical experience and a very considerable number of mixed metaphors and flowery expressions.

To sum up this part of my article, I would recommend the expert who has had no previous educational experience, and who has written a paper on his subject, to pass it over to his most intimate friend in any other department. If his friend can answer one or two questions on the subject matter of the paper after having read it through once, the expert can fairly anticipate a reasonable amount of success for his paper.

In some cases a paper is read dealing with some proposed modification, often in details of working, etc. Papers of this nature, if not inclined to be freakish, generally prove most interesting and productive of good discussion; but unfortunately in the majority of cases the details are such that a paper of half an hour's duration cannot give the hearers enough information to enable them to discuss it properly, and it might very well be made the general practice to type at least six copies of the paper and circulate them well before the date of reading amongst those most likely to discuss the subject dealt with.

The introduction of good homely illustration in the course of a paper is of extreme value. For example, such complex subjects as surface, tension or gyrostatics, lose half their terrors when illustrated by the aid of simple experiments with soap bubbles and spinning tops. Again, the partial and total reflection of electric waves (of so much importance in telephone study) is exactly analogous to the same cases of optical reflection, and can be simply demonstrated to an audience by means of a few sheets of glass, a beam of light and a screen.

It will readily be conceded that the amount of discussion is a criterion of the interest taken in the subject dealt with, and this is practically the same as saying that it is a criterion of the value of the paper, as an inherently bad or mediocre paper may be the means of throwing a great deal of light on the subject dealt with through the discussion that follows.

Now the amount of discussion depends to a great extent on the chairman of the meeting. A chairman who by his persuasive or magnetic power can induce some of the more retiring members to talk is a decided acquisition, as it is not necessarily the confirmed discussor who contributes the most valuable information. In this connection it may be of interest to mention that the relative zeal for discussion appears, as far as my experience goes, to vary with the latitude. I refer here to geographical latitude.

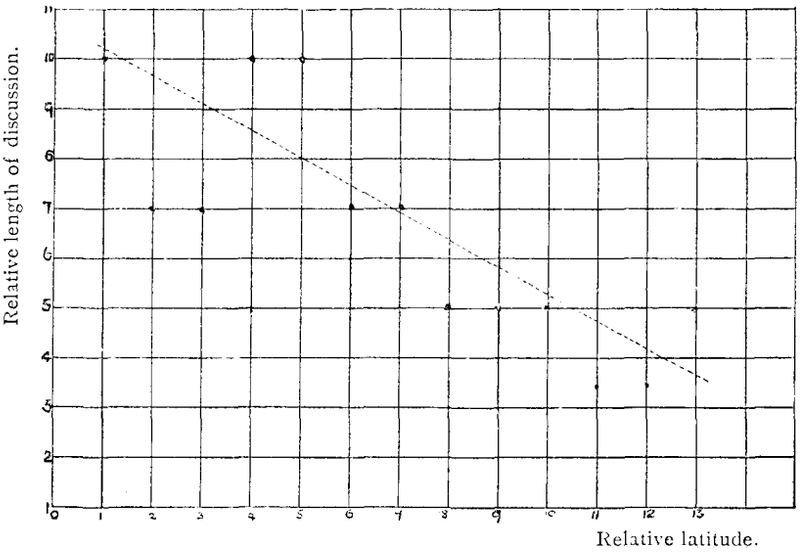
The curve given on this page shows very approximately the relationship between latitude and length of discussion, and nothing will induce me to reveal whether the abscissæ work from a northerly or a southerly datum. Needless to say the number of variables not taken into account in this curve render the result so approximate that only a general tendency can be taken as proved.

A point of great importance to my mind is the answering of each person who takes part in the discussion as soon as he has finished. The discussor and the discussee, if I may be permitted to coin the words, are brought into intimate contact and those present remember the points raised better.

Let me conclude with a few final tips to the beginner in paper-contributing.

(1) Remember that in order to be effective the style adopted in a paper to be read should be different from a paper dealing with the same subject, but for publication.

For example, when referring to two things do not say "the former" and "the latter," it is far better to repeat yourself. Also do not refer to yourself as the "speaker," there is no harm in occasionally bringing in the first person singular. Such sentences as the following, although perfectly legitimate in a printed paper, should not be used if reading:—"The connection of the "A" cord circuit (in this case it must be noted that the "A" cord circuit will be the receiving cord circuit) are now reversed."



(2) The value of a paper is not necessarily proportional to the amount of data given in it.

(3) A short experimental illustration may in one minute explain more than fifteen minutes' talk.

(4) Have full particulars of all data required written down. You may have certain facts as deeply impressed on your brain as your own name before getting up on your hind legs, but if you are at all nervous you may then even forget your name.

(5) If your time allowance is twenty minutes, get the length of your paper right by reading it aloud in a very deliberate manner with your watch before you.

It will be found that on the average a paper of 3,500 words can be read in twenty minutes, but this does not allow for stops necessary to illustrate lantern slides or diagrams, etc. The time taken to describe a lantern slide depends to a great extent on whether it is a diagram, a curve or merely a photograph of some apparatus. From my experience I find that an all-round average allowance per lantern slide of 1·25 minutes should be made.

TELEPHONE WOMEN.

XLI.—ETHEL GERTRUDE NELSON.

ETHEL GERTRUDE NELSON was born in Nottingham on June 3, 1883, and was educated at the Queen's Walk Higher Grade School. She joined the service on Jan. 12, 1900, as a Junior Operator, and her first experience in operating was obtained at the Company's old magneto exchange in George Street, Nottingham. At this time the Company's new exchange was in progress of erection, and in the June of the same year the system was transferred from the Thurland Street Exchange to the new

exchange in George Street. The transfer changed the working from magneto generator to automatic call and clear, and Miss Nelson was one of the first operators to be instructed in the new methods. She was appointed a Senior Operator on Jan. 5, 1904,

ETHEL GERTRUDE NELSON.

and by marked ability was promoted to be Supervisor on Nov. 15, 1905; a further step also being given her on March 8, 1907, when she was appointed Monitor. Miss Nelson is popular with the staff, takes a great interest in the social side and is an ardent cyclist.

XLII.—FLORENCE MARY BARKER.

FLORENCE MARY BARKER was born in Nottingham on Dec. 26, 1882. On May 28, 1897, she was appointed a half-time Operator at Carrington Exchange. This was a small sub-exchange originally intended for residential service only but subsequently developed

FLORENCE MARY BARKER.

into a fairly large exchange. Miss Barker remained at Carrington until the subscribers were all transferred to Nottingham Central Exchange in June, 1901, to which she herself was transferred at the same time. On Feb. 25, 1904, she was promoted to be Supervisor, but she only held the post for a few months owing to continued ill-health, which culminated in an operation for appendicitis. Miss Barker rejoined the service as an Operator in July, 1905, and on Dec. 22 of that year she was again appointed Supervisor. She has had experience of magneto, automatic call and clear and common battery working. She has also gained considerable experience in connection with the measured rate service, having been deputed to supervise and report upon the handling of tickets at various exchanges in the district, and in addition supervising the limited service sections of the switchboard at the Nottingham Central Exchange. Miss Barker represents the operating staff on the committee of the local benevolent society, is fond of outdoor sports and interested in religious work.

THE NEW LAND VALUE DUTIES AND THE STAFF'S CASE FOR PAST SERVICE.

A JUSTIFICATION OF THE STAFF'S CLAIM BY THE CHANCELLOR OF THE EXCHEQUER.

BY W. R. BOLD.

IN my article published in the July, 1908, number of the TELEPHONE JOURNAL, having quoted the numerous cases in which staffs on being taken over by a public body have been given the benefit of their past services, I stated that the claim of the Company's staff to the benefit of its past services was very much stronger, seeing that the royalties paid to the Postmaster-General amounted then to over £2,500,000, and would by the end of the Company's license amount to £4,000,000.

In the House of Commons on May 12, 1909, the Chancellor of the Exchequer, in speaking in support of the Budget resolution respecting the new land value duties, referred to the taxation of the mining royalty owner, and, as will be seen from the following extract from his speech, emphasised the principle that in fairness and equity the mining royalty owner should be called upon to make some special provision for those whose industry had produced the royalties :—

> "Now what does the mining royalty owner do? He has risked nothing, he has made no investments and no industry, and there is purely the industry which the hon. and gallant member says is a very hard one, namely, that of receiving. What is his contribution towards accidents, sickness or death in the mines? The colliery owner, under the Bill of the right hon. gentleman the member for West Birmingham, bears the whole of that burden, and there is no contribution from the royalty owner. As a matter of fairness and equity, is it unfair to ask that man, who has risked nothing when we are getting up a fund to provide for the sickness of those miners, for death, for widows and orphans and old age, to contribute one halfpenny in the pound?"

The Postmaster-General has risked nothing, neither has he made any investments or industry, but has equally with the mining royalty owner been performing the hard duty or industry of receiving. In the past when he has not even received he has granted staffs taken over the benefit of past services. The Company's staff ask for the same treatment, and are confirmed in so doing by the recognition by the Chancellor of the Exchequer of the principle that in fairness and equity the person receiving a royalty without risking anything for the same has special responsibilities to those whose labour and industry are employed in creating the royalty.

OFFICE WORK IN ITS RELATION TO TECHNICAL STAFF.

MR. PARSONS wishes it to be explained that the above, which was described as a "paper," was, as readers will no doubt have gathered from its colloquial phraseology, merely an *extempore* address to the Brighton society.

THE ANNUAL STAFF DINNER.

THE fifteenth annual staff dinner of the National Telephone Company was held on May 20 at the Empire Rooms of the Trocadero Restaurant, Mr. Albert Anns, the Secretary of the Company, presiding. On either side of him were Mr. George Franklin, the President of the Company, and Sir Henry Babington Smith, the Secretary of the General Post Office. Among the guests were Mr. G. H. Robertson, Major W. A. J. O'Meara, Sir Robert Hunter, Mr. C. S. Agnew, Sir John Gavey, Mr. W. A. Smith, Mr. C. A. King, Mr. A. M. Ogilvie, Mr. G. F. Preston, Mr. W. M. Mordey, Mr. E. Forbes-Lankester, Mr. H. H. Gaine, Mr. W. Duddell, Mr. J. Cowley, Mr. T. A. Welton, Mr. J. E. Kingsbury, Mr. H. Laws Webb, Dr. R. M. Walmsley, Mr. H. F. Anns, Mr. A. N. Bromley, Mr. S. Thirkell, Mr. G. Sutton, Mr. L. Stokes, Mr. R. H. Claxton, Mr. C. A. Baker, and Mr. W. M. Crowe. The chief officers present included Mr. Frank Gill, Engineer-in-Chief, Mr. S. J. Goddard, General Superintendent, Mr. W. E. Hart, Solicitor, and Messrs. C. B. Clay, J. C. Chambers, A. Coleman, W. W. Cook, R. A. Dalzell, E. Hare, C. J. Phillips, R. Shepherd and F. Douglas Watson. There were also present the following members of the staff and friends:—Messrs. W. Aitken, P. Alderton, W. Allan, H. S. Allen, J. M. Anderson, C. F. Ashby, C. F. Baldwin, F. G. C. Baldwin, V. Baldwin, A. Barclay, H. Barnett, W. Barnett, F. Barr, E. C. Bates, T. A. Bates, R. S. Beckwith, R. W. Bell, R. C. Bennett, E. S. Berry, J. H. Bigland, W. Biles, R. J. Blackwood, W. R. Bold, H. S. J. Booth, C. A. Bostock, C. H. Brandreth, J. Bridger, J. W. Briggs, F. B. Brown, W. Brown, J. C. Bullough, R. B. Bumiller, E. S. Byng, J. W. Campion, C. W. L. Carter, H. Chambers, C. Chanter, P. Chester, T. J. Clark, B. S. Cohen, J. F. Coote, H. G. Corner, T. Cornfoot, A. E. Cotterell, W. L. Coulsell, R. F. Crow, W. R. Crowe, W. Cullum, A. L. Curling, P. F. Currall, H. M. Darville, F. L. Davies, H. Deane, A. Dearle, A. L. De Lattre, A. C. Devey, F. C. Disher, A. L. E. Drummond, F. P. Dumjahn, H. Eady, P. Edmond, J. F. Edmonds, C. Edwards, C. Elliott, A. M. English, L. J. Farries, C. E. Fenton, W. Finlay, T. Fletcher, W. M. France, E. S. Francis, F. W. Francis, D. B. Fulton, J. R. Gall, W. E. Gauntlett, F. J. Gerrard, A. B. Gilbert, R. Gilmour, J. A. Gordon, H. C. Gray, W. J. Gray, H. Green, H. A. Green, G. F. Greenham, W. H. Grinsted, W. H. Gunston, J. Gwyther, A. C. Haley, J. W. Hambleton, F. Hanson, T. Hanson, F. C. Hawker, P. G. Head, H. J. Herink, E. J. Hidden, F. G. Hives, F. Homfray, E. Hooper, G. Hooper, L. T. Horne, W. Howe, C. Hughes, E. J. Jarrett, J. H. Jenkins, F. K. Jewson, E. J. Johnson, C. Ketley, A. M. Kidd, F. G. A. Kiff, J. King, J. H. King, P. P. Kipping, W. C. Knapman, E. A. Laidlaw, A. R. Lamb, F. D. Latimer, G. F. Lee, T. F. Lee, H. Legge, J. Lemon, W. U. Lonnon, F. A. B. Lord, J. N. Lowe, L. H. Lowe, A. Lumsden, S. Maber, D. Macadie, A. G. Mackie, A. Maclean, G. M. Maddock, A. Magnall, W. J. Marsh, G. A. Macdonald, H. G. McFarlane, J. Mewburn, C. J. Millar, W. J. Miller, A. C. M. Minns, S. Moody, C. F. Moorhouse, L. F. Morehouse, W. V. Morten, W. Napier, G. H. Nash, E. W. Newton, J. C. Nichols, F. J. Norton, F. Oliver, A. F. Paddon, W. Padget, C. T. Peacock, E. A. Pearson, H. M. Pease, W. V. Pegden, A. Perkins, E. A. Pettithory, S. J. Pharo, H. Phillips, C. W. Piggott, H. S. Plymen, S. H. Pook, J. Poole, P. H. C. Prentice, L. Price, T. A. Prout, A. Pugh, C. G. Ransley, H. Reid, C. J. Remington, T. C. Rhodes, F. W. Roberts, T. Rodger, A. E. Ruddock, F. W. Salisbury, C. W. Salmon, N. A. Saltmarsh, J. W. Sandell, J. Scott, J. M. Shackleton, J. Shea, G. M. Shepherd, W. H. Shinn, F. W. Shorrocks, C. H. Sibley, F. E. Sims, A. M. Sinclair, J. Sinclair, A. E. Smith, A. W. Smith, S. C. Smith, S. J. Smith, E. T. Spence, H. Staite, O. W. Stevens, G. Stevenson, J. D. W. Stewart, W. D. Stewart, J. Stirling, E. E. Stockens, J. H. Storrie, C. S. Street, D. Stuart, F. Summarsell, C. H. Summers, H. B. Sutcliffe, J. W. Swithinbank, C. E. Tattersall, J. T. Tattersall, W. Taylor, W. F. Taylor, J. S. Terras, H. S. Thompson, H. H. Thomson, J. E. Tinker, A. T. Turney, J. W. Ullett, W. A. Valentine, B. Waite, J. T. Walker, J. H. Wall, G. S. Wallace, A. S. Wallis, F. E. Waters, A. Watts, P. Wayne, W. E. Weston, C. E. Wetton, J. W. Wheeler, E. J. Whibley, J. T. Whitelaw, J. E. Williams, R. A. Williams, W. A. Williams, A. Williamson, E. Williamson, G. Wilson, J. H. Wilson, J. Wolff, C. S. Wolstenholme, A. F. Wood, F. A. S. Wormull, C. C. Worte, C. G. Wright and representatives of the following papers:—*The Times*, *Daily Telegraph*, *Daily News*, *Morning Post*, *Electrician*, *Electrical Review*, *Electrical Times*, and *Electrical Engineering*.

After dinner the CHAIRMAN proposed the usual loyal toasts, which were duly honoured.

Rising again, the CHAIRMAN, who was very cordially received, said that they had had a great disappointment to-night, for Mr. Sydney Buxton, unfortunately for them, had made an engagement for that evening before he received their invitation. He (the Chairman) was very sorry, as he was sure they all were, for they would have liked to give him a very hearty welcome, and he thought he would have been pleased to see the vanguard, if he might so call it, of that small but efficient army, which, sooner or later, would be added to his battalions. There was, however, a bright side to the picture, for they had with them to-night, one of those great public servants who were the brains, and the heart, and the backbone of the Empire of which they were so proud—one known to many of them personally, and admired by them all—Sir Henry Babington Smith. (Cheers.) Now, what had they been doing in the last twelve months? Well, their progress had not been so rapid as in previous years, and one of the reasons was the limitation of capital expenditure. The causes of that damping down, if he might so express it, of their expansion were somewhat controversial, and therefore could not be referred to there. But one of the results was that, in the autumn of last year, they were face to face with the problem of keeping on their construction staff without being able to find sufficient work to keep them all in employment. The idea of getting rid of men who had for so many years given hearty and loyal service to the Company—in some cases it had been the devotion of a lifetime—was repugnant to all of them, and their President, who, besides great intellectual attainments, had a kind and generous heart, induced the Board to hurry on works out of the ordinary course, so as to prevent, at all events during the winter months, causing men the distress which would have followed upon their dismissal. (Cheers.) He (the speaker) was sometimes twitted with being of too sanguine a temperament, but he still hoped arrangements might yet be made which would avoid inflicting on these men a wholly unmerited punishment. (Hearty applause.)

In the twelve months they had opened 88 new exchanges and added to their working stations 27,576. Now this did not give a true idea of the work which they had done, because it was a peculiarity of the telephone business all over the world that, no matter how good a service might be, a great number of subscribers give up their telephones every year. As a matter of fact, they connected up 53, 756 new stations and lost 26,180, and these cessations were a very serious financial burden on a telephone business not altogether appreciated by outsiders.

With regard to the total number of stations, they could not, of course, compare with the great nation across the Atlantic, where everything was on a gigantic scale, including earthquakes and Presidents—(laughter)—and where, owing to protective tariffs which were there, wisely or unwisely, in force, everybody appeared able to afford a telephone, but these little islands, so far as telephones were concerned, did occupy a proud position amongst the other nations of the world. A year ago, several references were made there to the introduction of the measured rate. Now, these rates were not agreed upon until after months and months of careful study and investigation, and it came upon them, therefore, as a great surprise, as a great shock, when a determined effort was made by representatives of important commercial interests throughout the country to have those rates withdrawn. Their would-be advisers, however, knew nothing whatever about the Company's business, and they (the Company) had very little to learn. Thanks to the firm front shown by the Postmaster-General, for modesty forbade him to refer to the part played by the National Telephone Company, the telephones as a commercial asset were saved to the nation. Now what was the value of their business to-day? Well, ignoring for a moment the fact—a very unpleasant fact—that they were working under a terminable license, the commercial value of their undertaking to-day was at

least £20,000,000. He did not think the public quite appreciated the gratitude which they owed to Mr. Sydney Buxton for having refused to adopt a tariff which would have imperilled, if it had not destroyed, the profits from the telephone business.

And now he came to a matter which was intensely interesting to all of them, and that was, what was to be the future of the staff? The agreement of 1905 was a good agreement for the shareholders, but it was not a fair agreement, it was not a just agreement for the staff. (Cheers.) In a modest way he was somewhat responsible for that agreement, and he would like to tell them that the Directors and the late General Manager fought most strenuously for fair terms for the staff. They were not successful, and the staff were naturally alarmed, and formed what has since been known as "The Staff Transfer Association." Thanks to the wisdom displayed in the selection of the executive officers, and to the ability and moderation with which those officers have pressed their just and legitimate claims, a fair measure of success—a well-deserved measure of success—had so far attended their efforts. The Directors and chief officials could not, of course, take an active part in the association, but it had always had and still had their sympathy and good wishes. (Cheers.) His optimism was undimmed and undiminished that when the end came they would all receive fair treatment. He gave them last year several reasons why he was so hopeful about the future, and he would now give them two more.

In Mr. Sydney Buxton they had a Postmaster-General who, since his accession to office, had shown himself most solicitous for the well-being of the great army of men and women which he controlled, and he never lost an opportunity of doing all he could to promote their welfare and happiness. ("Hear, hear.") That this was so, was shown by the esteem in which he was held by all branches of the Post Office Department.

His other point was this. The House of Commons had never, as a body, sanctioned an act which it knew at the time to be unjust, and if on the transfer of that magnificent business to the State a single member of the staff suffered, he said an act of injustice would have been committed. (Hearty applause.) He was very reluctant on an occasion like that to sound a mournful note, but he had a presentiment that this might be the last of these happy gatherings. Whether that were so or not, it would be a pleasant memory to all of them that they had helped in the foundation of that remarkable industry, and that they had been loyal in every sense of the word to their shareholders, to the Directors and to each other. ("Hear, hear.") He would now ask them to drink to the continued success and prosperity of the National Telephone Company's undertaking, under whatever banner they might march in the future, and with this toast he coupled the name of one for whom they had a sincere regard and affection, their esteemed President and Managing Director, Mr. George Franklin. (Cheers.)

Mr. GEORGE FRANKLIN, who was loudly cheered on rising to reply, said that when he heard the announcement a moment or two ago that there was to be a humorous sketch, he thought possibly by some strange concatenation of circumstances that duty was to fall upon him and the more serious business on someone else. (Laughter.) However, he was glad that was not so. His first words to-night must be those of very hearty congratulation to their Chairman upon the excellent speech that he had made. ("Hear, hear.") Those of them who knew Mr. Anns knew him not so much as a public speaker but as an actual worker, and among the many diligent and strenuous workers on the National Telephone Company's staff, there was none more diligent, strenuous and able than their Chairman of that night. (Cheers.) Mr. Anns had told them that he was usually considered something of an optimist, and he thought they would agree, having listened to his speech, that there were certain notes of optimism running through it, which were evident to every one of them. For example, greatly daring, his friend, the Chairman, ventured for the first time, he thought—he had never heard him do so before—to put a value on the Company's property. The only thing that astonished him about it was its extreme modesty. (Laughter.) Certainly he, with greater responsibility and less freedom, would have hesitated in that or any other audience to put a figure, he was going to say, anything near to that mentioned by the Chairman. There were one or two other subjects to which the Chairman referred and upon which he would like to say a few words, but he wished first to thank them for the generous hospitality which they—the staff—always accorded to the Directors, and they would allow him on their (the Directors') behalf to thank them and express their cordial appreciation. If they had any doubt at all about the physical fitness of the staff, that doubt would certainly have been dispelled by the remarkable enthusiasm with which they (the staff) received the toast of success to the Company. He took it that their invitation to the Directors there was, at all events, evidence of their belief in the oneness of the Company, whether of the staff, the Directors or the shareholders. ("Hear, hear.") The objects of the whole were one and the same. It was a great pleasure to meet those who, scattered as they were throughout the country, were doing their best, as one happened to know by observation at Head Office, to further the interests of the Company in somewhat difficult surroundings and circumstances. Their Chairman, in his optimism, referred to the fact that this might be the last dinner. Might he venture to enter a *caveat* and say he hoped this would not be the last dinner? ("Hear, hear.") If it should be the case that, during that year or next year, the National Telephone Company's business should pass over to the State as was recently suggested by the Postmaster-General, and if, instead of having their genial Chairman of that night in the chair, they had their friend, Sir Henry Babington Smith, he ventured to think it would be none the less enjoyable for them to look back on the dinners that had been as to look forward to the dinners yet to be. Their friend, the Chairman, referred to the agreement of 1905. He thought the less said on that subject the better. That agreement might or might not have to be adjudicated upon elsewhere; and, therefore, as the lawyers say, it was not open to discussion or consideration there, but they were at all events free to say a few words upon the development of that remarkable Company. Notwithstanding the abnormal conditions under which the Company was working, they found that its revenue for the past year, ended March 31 last, was £3,081,585—twice as large as it was seven years ago. Then out of that they paid the Postmaster-General £283,758 for royalty which, he supposed, would obtain a little accretion as a result of the victory of his friend, Sir Robert Hunter, in the House of Lords the other day, on the question of the "A" and "B" lines. That it was worth fighting for was shown by the judgment of the Court of Appeal, and that it was better worth appealing against was shown by the final decision of the House of Lords. Well, the total royalty paid to the Postmaster-General from the beginning was £2,829,528, and that was a royalty which had been paid without any consideration. In these days of great depression and Budgets, he thought it was not a bad thing to remember that that Company in its day and generation had presented the State with the value of two Dreadnoughts which, in times of suggested weakness in their Imperial defence, should be worthy of remembrance at the hands of the powers that be. And if the royalty went on increasing as it had been doing, and the Postmaster-General kept his accounts on the same lines as the Company, he would be able to present a Dreadnought at least once in five years to the Imperial Parliament. (Laughter and cheers.) They had heard from their Chairman that night that notwithstanding the abnormal conditions under which they were working there were now some 1,555 exchanges, an increase of 75 over the number last year. The total number of messages over the Company's system during the past year reached 1,323 millions, being an increase of nine and a half millions over the previous year, and, dividing the revenue by the number of messages, they had a cost per message of ·49*d*. That was something less than ½*d*. per message. As to the service, he wished to say how much the Board appreciated the great improvement which had taken place in London. He was not wishing to institute any comparison between their London service and the Post Office service. As they knew, it was a competition of efficiency in service, not in rates, and he was glad in the presence of Mr. Preston and others to make him a present of what they found from their experience with regard to the London service. As the result of the tests made, in many thousands of cases during the half-year ended December last, the average time elapsing from the moment when the subscriber began to call until the operator said "Number, please," was only 4·70 seconds, and the average time from the commencement of the call until the called subscriber was on the line was only 38 seconds. (Cheers.) And if they went from London to the provinces they found the story not greatly different, because

there the average time from the commencement of the call until the called subscriber was on the line waiting varied from 22 to 45 seconds. He thought the results of those investigations went to show that the service was creditable to those who, day after day, were doing their best to make it efficient. ("Hear, hear.") Then, in reference to the Company's plant, he had often heard it said, "But you have overhead plant," and so forth. It would be interesting to them to know that of the line plant, the mileage underground was 71·3 per cent., and the whole of the overhead equalled the difference of 28·7 per cent., so he thought that, at all events, showed that with nearly three parts out of four of the line plant underground, the Company had not been idle in furthering that policy of development in which the Board felt the strength of the Company's position from the shareholders' point of view must be found. (Cheers.) So much with regard to line plant. Then they came to the central battery exchanges, and there he thought the result was no less satisfactory. They found the percentage of stations working on the central battery system was 26·6, and that there had been since the commencement of that year six central battery exchanges opened, and there were 26 more in hand to be opened in due course. With regard to the telephone development generally, it was interesting to know that the number of stations according to population, including all administrations in Great Britain, was 1 to 78 inhabitants as compared with 1 to 137 inhabitants in 1903. Those figures, he thought, were eloquent of two things, first, the policy of the Board to develop the business, to make it grow, and show that the telephones were fit for their work; and second, they were elequent of the great work which had been put into this industry by the members of the staff scattered throughout the country.

Their Chairman that night had alluded to a subject which, twelve months ago, was a very burning subject—the question of the measured rate. Then they had a controversy raging as to the principle upon which telephones ought to be paid for. It was hotly contested, and the only scheme in which the telephone user could find salvation was the universal or flat rate, and the measured rate could find no place in telephone economics. Well, events had moved rapidly since then. The policy of the measured rate had been practically universally adopted, and he ventured to think it would be found, if it was not already found, that those who advocated the flat rate as against the measured rate, were really not merely standing in the way of their own interests, but were standing in the way of the development of the telephone service, and he thought they might be compared with those who preferred the stage coach to the railway or the motor car, and, in these days—might he whisper it?—with those who preferred the telegraph to the telephone. (Laughter.) Upon that question of the measured rate, the attitude of the Company had been compared to that of a useful and a humble quadruped—namely, the mule. Well, he thought, even a comparison had its lessons. He had known mules tempted, and made to fall if you met them face to face and offered them a nicely trimmed carrot, but if you approached them from behind—well, you were apt to retire disfigured. (Laughter.) And whilst he wished to point no moral and adorn no tale—(laughter)—yet he could not help thinking there might have been some aptitude in the comparison made.

And now he wanted to say a word or two on the subject which, perhaps, was more interesting to them than anything else—and that was, the question of the staff. ("Hear, hear.") He gathered that there was a certain amount of natural anxiety prevailing as to the rumours of negotiations with the Postmaster-General, and as to the effect of possible negotiations upon the Company's staff. He sympathised entirely with such anxiety. On the other hand, there were no secrets to divulge. In all discussions upon this subject, whilst the interests of the public and the interests of the shareholders must be considered, the Directors recognised the necessity of seeing, so far as lay in their power, that no injustice might fall upon any individual member of the staff by reason of the transfer to the State whenever that time might be. (Cheers.) And, as their Chairman had said, the very fact that the Postmaster-General had shown himself, in regard to his present staff, to be sympathetic and getatable in such a way as no former Postmaster-General had probably ever shown himself to be, he thought that should give them confidence, and also encourage a belief in a solution fair to the public interest and satisfactory to the staff. ("Hear, hear.") It was no mere formal expression when he said that the Company and the Directors warmly appreciated the continued devotion of the staff to the Company's interests. No Company was ever better served by its staff than the National Telephone Company, and the Directors, who knew and appreciated the service of the staff, would endeavour, as far as they were able, to secure a just and liberal interpretation of the declaration in the House of Commons by the present Lord Derby, following upon the agreement of 1905. (Cheers.) Now, they would recognise, he hoped, that the Directors were quite as alive to the interests of the staff as, he was sure, they were alive to the interests of the shareholders, and he did not believe that these interests were divergent, whilst, he could readily understand, the rumours of negotiations created anxiety in the minds of the staff as to what was to become of them and what was to be their position; he could only ask them, as he asked the shareholders from time to time, to have some confidence in the Directors who were endeavouring to do their best and would endeavour to do their best in regard to those negotiations, and depend upon it the interest of the staff would not be lost sight of. (Cheers.) That was as much as he felt he could say that night on the question, and might he wind up by saying how much they (the Directors) appreciated their continued hospitality to them year after year, how much they enjoyed the opportunity of meeting each other face to face on these annual occasions, and how much they would regret if circumstances were to be such that they were to be divorced from each other in the future. ("Hear, hear.") But, at all events, they might depend upon this, that they would not find one Director of the Company lacking in looking after their interests when the time comes. (Cheers.)

Mr. W. E. HART said as that was the first opportunity he had had of speaking to any considerable number of those who were his fellow-servants on the staff of the National Telephone Company, and as his duties, although bringing him into contact with probably most of them, did not bring him into personal contact with them as he would like, he desired to be allowed to express the pleasure he had, as one of the members of the staff, in meeting in such a way as this those who were associated with him, and he with them, in assisting to the best of their power in furthering the interests of the National Telephone Company. (Cheers.) He could not but feel how difficult it was for them to know one another, except in a casual way, and one welcomed an opportunity like that though it were so circumscribed, of meeting those whom one knew and with whom one corresponded so frequently. He had pleasure in submitting to them the toast of "Our Guests." They had there representatives of many and varied interests. If they looked at the names that are on the plan on the programme they found representatives of business firms of world-wide reputation, and it gave one some idea of the many-sided activities of a large Company like theirs. They were glad to welcome all these representatives, and particularly he asked them to welcome those friends of theirs who represented the Post Office. (Cheers.) They had been glad to see that during the past year His Majesty had conferred a signal honour upon Sir Henry Babington Smith, upon which they congratulated him very sincerely. (Cheers.) He had nothing to say to their friends of the Post Office as to official matters. He found they were very fond of having their own way, and very often they got it. (Laughter.) But putting official matters on one side, one was glad to welcome them there for the interest their presence showed in those who were to come before long under their immediate influence, and he thought it was a good augury to find that so many gentlemen representing the Post Office were there that night and favouring them in that way, and showing in anticipation that still closer interest which, he was sure, they would take in the members of the staff. He had also to ask them to allow him to say just a word in reference to the Directors of the Company who were there that night. He had been asked to say that some of them were prevented from being present; Lord Harris by another engagement he could not avoid; Sir Albert Rollit, unfortunately, by illness; and Mr. Sands found himself unable to stay in town for the dinner, owing to a sudden serious indisposition. They had, however, other members of the Board with them, and he was sure they all felt that interest in the staff which the President had so eloquently and so kindly given expression to, and which, he was sure, would be fulfilled in th

time to come. He had pleasure in submitting to them the toast of "Our Guests," and he coupled with it the names of Sir Henry Babington Smith and Mr. William Alexander Smith, their worthy Director. (Cheers.)

Sir HENRY BABINGTON SMITH, who was cordially received, expressed on his own behalf and on behalf of his fellow-guests, especially those from the Post Office, their very warmest thanks for the staff's hospitality that evening, and for the very kind reception which they had given them. That was the first time that it had been possible for him to attend one of their annual gatherings, although it was not the first time that he had been honoured with an invitation. Two years ago he was looking forward to the pleasure of coming to their annual dinner, and they were all aware of the circumstances under which that dinner did not take place. He would not like to let this, the first occasion on which he had been a guest of the staff of the National Telephone Company, pass without paying his tribute of respect and esteem to the man to whom in so high a measure the prosperity of this Company and of the great business it conducted was due. (Cheers.) He had also a message to give from the Postmaster-General, who asked him to say how very much he regretted that he was not able to be present there to-night, and to have the opportunity of making closer acquaintance with some of the staff which sooner or later would pass under the orders of himself or his successors as the case might be. He was sure it was a matter of real regret to Mr. Buxton, and possibly it remained to be seen whether the omission could be repaired on some future occasion. (Cheers.) Well, the acquaintance of the Post Office and the Company had been a long one. It began when the Company was in its cradle, or even before that. Indeed he was not sure the Postmaster-General might not claim to have been the godfather of the Company. From what their President had said he was not quite sure that he (the President) would not contend that the civilities which were usual on such occasions passed in the wrong direction. Well, there might be something in it; but, on the other hand, he was not quite sure that it might not be contended that the result had in reality been of the utmost benefit to the Company. Their old friend Horace talked about the oak when shorn by the axe deriving strength and courage from the steel itself. He was not quite sure that it might not be argued that the necessity of finding the modest tribute which passed into the coffers of the Postmaster-General had not supplied the stimulus, the spur to greater exertions, which had really been at the bottom of the success of the Company. Well, the acquaintance, as he said, of the Post Office and the Company had extended over many years. They had had much in common. They both lived for the purpose, amongst others, of rendering service to the public, and they were both aware that the public was always exacting, and not seldom ungrateful. But, at the same time, those services had been rendered in kindred departments, in some cases in the same department, and he thought he might claim, on their side, as the staff would no doubt claim on theirs, a claim he would be the last to disallow, that they had been rendered with success. The acquaintance ripened some four years ago into something more than friendship. It eventuated into something in the nature of an engagement. Well, they were aware that long engagements sometimes led to difficulties—(laughter)—and, as had already been indicated in some speeches to which they had listened that evening, the long engagement between the Post Office and the National Telephone Company has not been entirely free from resulting difficulties. The date at which the marriage was to take place was fixed in the original engagement for the beginning of 1912. They had heard that evening that the Postmaster-General made a suggestion in the House of Commons recently that the date might be advanced. In fact he indicated, he thought, in well-known words, that "Barkis was willing." (Laughter.) The only obstacle so far as he saw to an earlier consummation of the marriage were some little questions connected with settlements. (Laughter.) Whether those questions could be satisfactorily put out of the way was not a matter which entirely depended on the Post Office, and on the subject he must refer them to Mr. Franklin. But whether the marriage took place at the date originally fixed, or at an earlier date, he was sure they were all agreed in hoping that the union, when it did take place, might be an auspicious and fruitful one. Well, to drop metaphor, they were both interested in a great public service which had a great future. How great the future might be it was difficult for anyone to say to-day. They had both been concerned in the progress of the service in the past—the National Telephone Company in by far the larger part of it in the local services all through the kingdom, and the Post Office for some years past in the development of the part of it which made the connections between the local service, and also to some extent in the local service in London and elsewhere. That service he thought had a great future. If it had remained in the hands of the Company he had no doubt that that great future would have been realised. He hoped that if it passed into the hands of the State that future would no less be realised, and he thought he might say this—that when the service passed into the hands of the Post Office the staff of the National Telephone Company might feel that they would find a welcome in joining a staff which already formed part of the great service of the Post Office. (Cheers.) He thought they might feel in the development of the service under the State that there would be full scope for all the zeal, for all the energy, and for all the ability which had contributed in the past to the success of the affairs confided to the Company, and he thought they might feel too, with the utmost confidence, that they would certainly not meet with any treatment which could be described in any way as unjust or inequitable. (Cheers.) It was always difficult to predict beforehand difficulties that might arise, questions that might arise, but whatever difficulties or questions might arise, he thought that the staff of the Company might feel confident as to the spirit in which they would be treated, and he thought they might feel confident, too, that every effort would be made by those who in the Post Office were responsible for the conduct of that affair to remove as far as possible, or at least to minimise, those difficulties which were the inevitable concomitants of a period of transition from one authority to another. He would only conclude by echoing the wish of an earlier toast—the prosperity of the National Telephone Company, so long as it remained in life, and prosperity to the great service it had conducted hitherto, in whatsoever hands the service might in future be reposed. (Cheers.)

Mr. W. A. SMITH said that to copy the words of a recent Postmaster-General he came there that night to enjoy a good dinner and not to make a bad speech. (Laughter.) But when he came in, his friend, Mr. Anns, told him that owing to the lamentable absence of his dear old friend and colleague, Mr. Sands, he wished him to join Sir Henry in responding to the health of their guests. He deeply regretted that that responsibility had not fallen into worthier and abler hands, and especially did he regret the absence of their old friend, Mr. Sands. He might tell them that Mr. Sands and he were now the only two living Directors of the old National Telephone Company, the original company which bore that title, and he therefore deeply regretted that he (Mr. Sands) should not be able to be present to-night. He regretted also very much that the original responder to that toast, their dear colleague Sir Albert Rollit, was not with them. (Cheers.) He was sure they would all miss his genial presence and his lively tales—(laughter and cheers)—but he must tell them as a great secret that he (Sir Albert) disclosed to him one of the stories he was going to tell them to-night, and he had it on his mind before he sat down to tell it to them. ("Hear, hear.") He was particularly glad in one sense that he should have the opportunity of thanking the staff for the honour and the pleasure it gave them, the Directors of the Company and the other guests, to be there as their guests that night. He was all the more glad of it when he remembered that, he believed, the first gathering of the staff of the National Telephone Company was held in Glasgow 28 years ago next November. It had always been the desire of the Directors of the Company to cultivate with their staff the most friendly and cordial relations, and he was speaking not only of himself but of everyone of his colleagues who were there that night, and of those who unfortunately could not be present. He believed that the success of any great industrial enterprise was bound up, not only with those that were at the head, but also with those who did the everyday work, the hard and rigorous work demanded by such services as that of the National Telephone Company.

He had not to reply for the Post Office officials (which Sir Henry Babington Smith had so ably done), and he cordially agreed

that their relations with the Post Office were on the most friendly footing. ("Hear, hear.") He (Sir Henry) had talked about their engagement. Well, he was one those who could go back to the first mention of the marriage, nearly 30 years ago, with Sir Henry's predecessor, the late C. H. B. Patey, and the great Postmaster-General, Henry Fawcett, because with both of those men he was intimately connected, and had to do with the original granting of the licence under which they worked to-day. Therefore it was a source of pleasure to him to be their guest to-night, and to respond cordially to their great hospitality. He might say that he had thoroughly enjoyed his dinner, notwithstanding the fact that he had a speech to make—(laughter)—and he believed that everyone of the guests for whom he was responding had done likewise. He did not think Sir Albert Rollit's story would come in very appropriately, but still he felt that he ought to tell it to them. It was at a dinner something like that one. It was about two Scotsmen, and, being a Scotsman himself, perhaps he should not tell it, but still the story was too good to be omitted. The two Scotsmen were at dinner, just such a dinner as that, and they enjoyed themselves very well indeed. Not only were the comestibles good, but there was very good liquor with which to wash them down. (Laughter.) When they were going away, one of them came to the other and said, "Dougal, ma mon!" Dougal is generally the Scotch for Douglas, but he did not refer to his friend Mr. Douglas Watson at all. (Laughter.) They all knew that his abstemious habits would not lend themselves to that particular tale. Well, one of the Scotsmen said, "Dougal, ma mon, remember this. When ye go doon after dinner the stairs are verra narrow and verra steep; so ye maun be verra careful. And when ye come to the bottom ye will see twa cabs there. Ye tak' the first one—the other will no be there." (Laughter and cheers.)

Mr. FRANK GILL, who rose amid prolonged applause, said that the toast of "Engineering" which he had the honour to propose was one of a very wide nature indeed, and yet he was glad that it had been couched in such wide terms, because it enabled him to refer to the activities of telephone engineers, that being, perhaps, easier for him and less unpleasant for his hearers, and he did it with the more pleasure because they had the privilege that night of having as their guests other telephone engineers than those connected with the Company. He was travelling North one day by train, and he was having dinner with a man sitting opposite to him, a well-known public man, who had had a title conferred upon him. They began to talk, and after a little time this man invited him to say what he did for his bread and butter. He said that he was an engineer with the telephone company. The public man said, "An engineer with a telephone company! What engineering is there in telephone work?" (Laughter.) Well, there was really quite a little engineering in telephone work, and they sometimes called themselves electrical engineers. They hoped they were, but he thought also, perhaps, they were a little in danger of forgetting that much of their work concerned engineering which was not electrical. Many of their problems were mechanical. Take, as a simple illustration, the harmless, innocent-looking thing—the cable sheath. It was perfectly simple and harmless, like the necessary cat; and yet it was a thing into which a great deal of research and design as an engineering problem had been put. Again, in the building work, they had mechanical problems. Then when they came to some of their most serious problems, they had things concerning the fundamental plans, the economical lay-out of plant, the study of rates and traffic. Some of them had heard something about traffic that day, and, in a way, it was a science in itself. All those things were really much more in the nature of civil engineering than electrical engineering. When they came to the electrical side, their most interesting work at the moment, he thought, was the study of transmission. At all events, men all over the world had put in a tremendous lot of very valuable research work on the study of transmission. It was a very difficult subject. They would appreciate that when he said that the energy and current dealt with was exceedingly minute and the frequency very rapid. In their ordinary work they usually calculated upon a thousand waves per second, and altogether it was a subject which had required a great deal of research and skill to prosecute. It was a subject which had required perfection of special apparatus and methods of carrying it on, and he was glad to say that the result had been so far fruitful that telephone circuits were to-day designed with nearly as much precision as electrical lighting, traction or any other electrical form of circuit. He referred just now to the question of apparatus. It was a very special pleasure, certainly it was to him, to have there that night one, in the person of Mr. Duddell, who had done more perhaps than anyone in the world to give them the means of accurate measurement of current and energy of the magnitude he was speaking about. He would further refer to his oscillograph. They had two of those instruments in their research laboratory, and they were regularly used for photographing waves which had a duration of something like 1-3,000th part of a second. As an illustration of the magnitude of the current which telephone men have to deal with he might give an illustration of what happened in an ordinary trunk talk. They had to get to the consumer an amount of energy such that they required 16,000,000 similar conversations set up at the same time to equal the energy consumed in an ordinary 16-candle-power lamp. Now it was a very tough problem to see that this small amount of energy arrived at the far end just in the well-behaved and orderly manner that it should. It was a difficult problem also to measure with accuracy amounts of such very small degree. There was one thing that telephone men had not been able to do and, he was afraid, they would not do it. They had not been able to supply current for speech at 1*d.* per unit, or at a price which compares with electric lighting concerns. Mr. Cohen had worked this matter out for him, and it might be interesting to them to know what was the cost per unit of speech current. It came to about £16,400. (Laughter.) He asked them not to forget the £400. All telephone men were peculiarly enthusiastic, and he hoped they would allow him to claim a little for himself. The business of the world, generally speaking, covered two operations—manufacture and transportation, and their business dealt with the latter, not of the actual goods, but of the intelligence without which the goods cannot be made or transported to the user. He did not know of any other public service which carried a more far-reaching ideal, a service more fraught with benefit to mankind than the telephone service. He believed that there was an immense future in front of the telephone service, and when one thought how vast was already the net-work available to the subscriber at any hour of the day or night for any purpose—social, business or emergency—one was grateful for having been permitted to take some part in the up-building of a service of such use to the public. ("Hear, hear.") The engineering of an industry concerned the installation of the plant which was to meet the requirements of the service, but it covered also much more. In some cases the engineering people were looked upon as keepers of the box of mysteries which were called for when wanted, and put away at other times. But they in the Company had been favoured with an unusually clear-sighted policy on the part of the Board, in that they had realised how much engineering entered into the whole conception of the business. It was a great pleasure for him to be able to say that. But with the privileges came also responsibilities, and the proper engineering of any business was bound up with the question of a profitable undertaking. He thought that once a plant had been constructed the stability of the concern was very nearly, if not quite, determined. If the plant was laid out well the industry was almost bound to be a success. If, on the other hand, it was not laid out well it was difficult for those in charge to rescue it from—should he say bankruptcy? Certainly he believed that the engineering of any concern, especially of any growing concern, was a vital problem, and one could not regard as sound engineering any piece of work, however splendid in itself, which did not produce the required return. ("Hear, hear.") He did not mean to say that engineering people were more important than anybody else, but they were very necessary. With that toast he was asked to couple the name of Mr. Mordey, the President of the Institution of Electrical Engineers. He did this with peculiar pleasure. Mr. Mordey was the exponent of all that was best in British electrical engineering, and he thought they might claim almost a personal pride in Mr. Mordey in that he came from what was sometimes termed the light engineering side, and the eminently successful career and

(*Continued on page* 66.)

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THE OFFICERS' MEETING.

THERE were many things which combined to make the Annual Meeting of Officers, held on May 20 and 21, at Hamilton House, London, especially interesting. One was the restriction of the discussion to one paramount question, "Traffic"; and another was the inclusion of ladies among the invited for the first time.

The value of a discussion obviously depends upon the ability of those present to take useful part in it, and, consequent upon the special and comparatively confined nature of the papers read, many new faces were to be seen at the meeting and many familiar faces were missed, notably those of the contract managers.

The experiment made by the Company in inviting representatives of its enormous operating staff to attend this annual gathering was a liberal-minded one, and seems to have been fraught with a considerable measure of success. We are confident that its effects will be beneficial in making a hard-working and enthusiastic branch of the staff feel that they are playing, through their representatives, a direct part in the councils of Head Office, and we are sure from the very happy speech made by Miss MINTER in returning thanks for the ladies, that the compliment was appreciated. The ladies themselves contributed some interesting remarks to the discussion, and demonstrated in a convincing manner the keenness with which operating problems are grappled with in the switchrooms in all parts of the country. The operators are engaged in exacting, important, and, in a manner, unseen duties, and it was, no doubt, the desire of the Company to make them realise that they are an integral part of the whole scheme, and take, if possible, an even greater interest than heretofore in the public service they perform.

The apparatus of elaborate traffic study has in the nature of things been applied more frequently and more fully to the principal exchanges, where the scope for experiment and reform is greater. The large exchanges, although by far the most important, are in a very considerable minority, and one effect of the meeting will undoubtedly be to throw the searchlight of traffic study on all sorts and conditions of exchanges.

COMPETITION AND THE HIGHER IDEAL.

THE question of competition between teams, naturally engaged a considerable amount of attention at the Annual Meeting. The subject has figured somewhat largely in recent issues of the JOURNAL, and in this connection we may record that a recent editorial was half-humorously described by Mr. EDMONDS (in speaking in favour of this form of rivalry) as "the Service Instruction in the April number of the JOURNAL." The hit was well received, but, like many other half-humorous remarks, it was very far from being accurate. The leading article in question was in no sense a service instruction, but a legitimate editorial comment. It is no secret that the Editing Committee consists of four of the chief officers of the Company, but it must always be remembered that any editorial observations appearing in the JOURNAL are made by them strictly in an editorial, and not in an official capacity. It is the privilege of editors to pass criticisms on matters of interest in their columns, and this privilege the Editing Committee always propose to exercise; but our criticisms are to be read only for whatever light and leading they may contain, and any instructions it may be found necessary for the Company to issue always have been and always will be sent out by the chief officers in their official capacities.

Mr. COOMBS spoke enthusiastically in defence of competition between divisions, and there is no doubt his views were shared by a large number of those present. His point was that the operators themselves like it; that it begets keenness, and introduces a stimulating factor of interest in their work. It was claimed that the practice did not interfere with the co-operation of adjacent teams, although it would naturally appear that competition was the very opposite of co-operation. Yet Mr. COOMBS was able to point to increased efficiency in his exchange, and to the fact that 400 new direct lines had been added without the creation of a single new "A" position on the board, and that the speed of answering had increased from five and a half to four and a half seconds. Mr. ALLAN, of Glasgow, on the other hand, pointed out how the stimulus of competitive team work might be used as a cover for faulty distribution.

Mr. GILL, in summing up, considered the matter broadly on two grounds: Was the principle sound? Were the results obtained so accurate as to reflect truly the merits of the different teams? We think the practice must ultimately stand or fall upon whether it is inherently sound or not. The question of whether it is stimulating or fascinating (although matters of great importance) will then appear secondary.

It is very desirable indeed that the views of the operators who are so much concerned in this question should be heard, and the letter of Misses FITZGIBBON, SHORT and MANNING, which appeared in last month's JOURNAL, is of great interest. The Company's operating staff has fully demonstrated its capacity for appreciating all that leads to a higher conception of our profession.

Our conception as to why team work by the whole exchange carries a higher motive is that it means a great degree of unselfishness, in that the individual puts herself aside for the benefit of the whole group more when forming one of a large than when one of a small group. The very fact that it is harder to put oneself in the

background in order to benefit the whole exchange, consisting of, say, 100 persons, than it is to do the same for a division of, say, nine individuals, shows that the ideal is a higher one.

One would indeed be sorry to think that those who have shown so much interest and enthusiasm should lose heart, but, as Mr. STEWART suggests in his letter this month on this subject, probably this argument is not meant seriously. It only needs to be realised that the course advocated last month is really the higher ideal for those who have achieved such excellent results with other methods to respond.

STORES AND STATIONERY.

SUCH papers as that read by Mr. SALMON before the Bristol Telephone Society (which we print in full in two instalments), demonstrate very strikingly the many-sidedness of the Company's enterprise, and throw an interesting light on the magnitude of its operations. One reads, for instance, that the Stores Department at Head Office deals with over 2,000 different firms of suppliers and that the wide range of its purchases embraces over 2,000 articles. The processes of obtaining tenders for, examining, and distributing the multifarious kinds of stores used by the Company require a complex organisation, the significance of which is not realised by the average man until it is brought before his notice by arresting facts or figures gleaned from some such paper as that referred to. One reads, too, of directories requiring printed proofs weighing one ton, and containing columns reckoned by the thousand, and names of subscribers by the hundred thousand. A well-known firm employs 200 compositors and 40 proof readers upon it. But besides putting the bulk of its work out to large printing firms, the Company has—at Telephone House—for printing its various service instructions and stationery, machinery and a staff of men far greater than that employed on many a country newspaper.

Again, the methodical arrangements for the summoning of staff for the instantaneous despatch of stores in the event of a fire or storm helps to explain those prompt re-establishments of communication after such calamities which we have from time to time recorded in the JOURNAL.

TRAVEL ON THE TELEPHONE.

FROM the lips of a man
Through ebonite portals in haste I ran,
I came to a door of silvery sheen
And through its vibrations I entered in
Through a corridor black with carbon old,
Till I came to a door that seemed of gold.
It op'ed on a hall with walls of brass
Full of atoms that crowded to let me pass;
Thence out on the line with a rush and a scurry
(Although I'm in haste I don't get in a flurry),
With many a twist round the primary coil
And on to the second sans ticket or toil.
Then over the line I went swift as the light
To pass through a screw to a hall of night,
Through magnet and coil till I came to a door
Which allowed me to pass, and my journey was o'er.

—E. M. BUCKLAND.

SINCE its inception in September, 1904, the Ayrshire district staff has contributed over £34 to the infirmary fund. This sum has been paid over in the name of the employees to the local infirmaries.

HIC ET UBIQUE.

WE are constantly referring to the minor benefits of the telephone as they come before our notice. The latest *rôle* of that indispensible necessity is that of knight errant or rescuer of damsels in distress. In the Legislature of Austin, Texas, a lady stenographer got herself locked in the clerk's room during a "call of the house." All pounding on the door and loud calls for release were in vain, and the lady becoming desperate bethought her of the telephone, and rescue in the form of the sergeant-at-arms promptly arrived.

WE hear that an American telephone company has the adoption of the appalling word "phoniste" for operator or telephonist under consideration. We fervently hope it will stop there. The "creator" of the word, a press-clipping man of New York, has, it seems, nobly offered to relinquish his rights in it in case of its official adoption.

If we could create a word to describe scathingly and adequately that press-clipping gentleman we would certainly not relinquish our right in it. It would be too precious and comprehensive a word to part with lightly.

"The National Telephone Company," says the *Aberdeen Evening Gazette*, "have just decided to lay the Fraserburgh system underground. *It is worthy of remark that Fraserburgh is the first provincial town in the country to be singled out for this much desired improvement.*" . . . We can only say, this is indeed . . . *news!*

IT is said than an ingenious-minded lady has suggested to the Postmaster-General that in order to increase the postal revenue it should be compulsory to make all proposals of marriage by telephone. This reminds us somewhat of the enactment in Mr. Gilbert's *Grand Duke*, by which all courting had to be done at stated hours in the open market place—opera-glasses being a grand-ducal monopoly.

THE LOVER'S LAMENT.

And is the Wireless Message of the past
Which flashed from eye to eye for ever gone?
(Effective call, which signified at last:
'Ring on').
The days of bended knee and hand on heart,
And deep and moving sigh, where are they now?
Departed! And the swain transmits by Art
His vow.
For each divinity shall get her "ring"
Ere yet the youth his fervent vow protests
(Faint wedding bells the telephone's ting-ting
Suggests).
And she who favours not the tale love tells
No more need frown, deny, reject or scoff,
But simply hang receiver up—or else
Ring off!—W. H. G.

DETERMINATION OF THE NUMBER OF PAIRS OF WIRES REQUIRED FOR PRIVATE BRANCH EXCHANGE POWER LEADS.

BY H. PLANCHON, *Engineer-in-Chief to the United River Plate Telephone Company, Buenos Aires.*

THE transmission of the extension instruments connected to a private branch exchange varies in proportion to the pressure at the bus-bars.

The pressure at the bus-bars is inversely proportional to the distance of the private branch exchange from the main exchange, to the number of pairs of cords in use at the same time, and proportional to the pressure of the exchange battery.

The only variable for a given private branch exchange is then the number of pairs of cords in use at the same time, and if more cords are in use the drop of potential at the bus-bars will be greater for a given resistance of the power leads.

If this drop of potential is such that the pressure at the bus-bars falls under, say, 14 volts the transmission will be poor, and the cut-off relays of the cord circuits used on exchange connections will not work.

The drop of potential on the power leads can be cut down by decreasing the resistance of the power leads, either by connecting more wires between the exchange battery and the private branch exchange or by connecting wires of larger diameter.

The problem then consists in determining the number of pairs of wires to be used as power leads between the exchange battery and the private branch exchange for a minimum value of the pressure at the bus-bars and for the maximum number of pairs of cords in use at the same time.

Let E = the pressure of the exchange battery.
R = the resistance of the power leads from the exchange to the private branch exchange.
U = the pressure at the bus-bars of the private branch exchange.
R^1 = the combined resistance of the maximum number of pairs of cords in use at the same time.
I = the current flowing in the power leads.

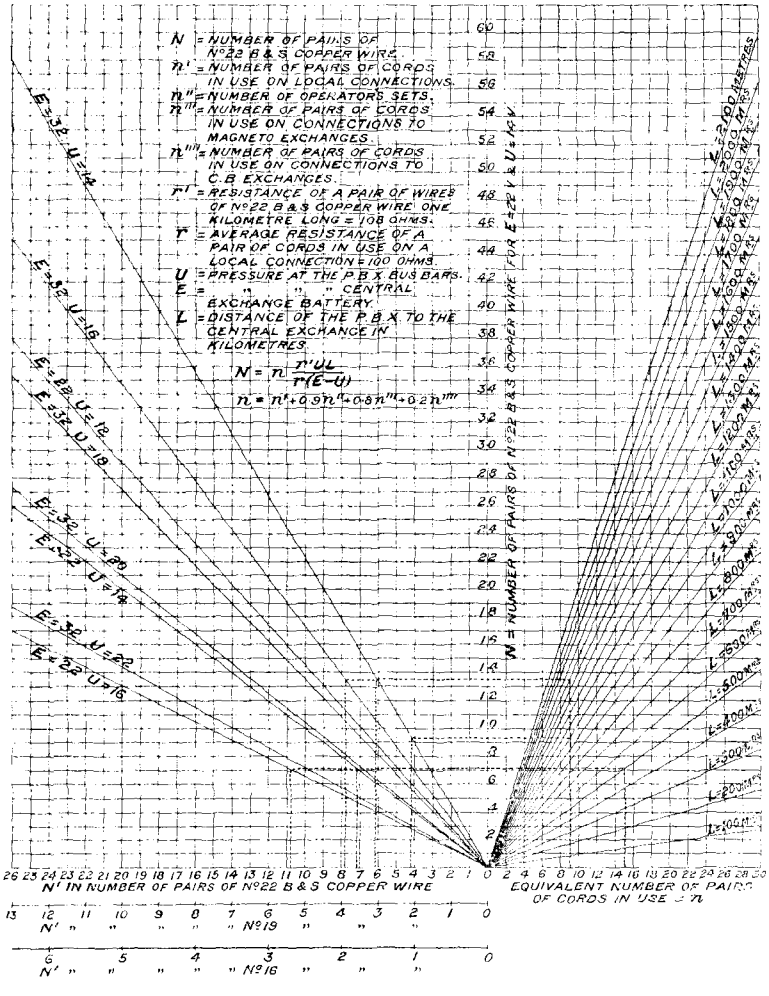

FIG. 1

Pairs of wires required for private branch exchange power leads. Distances given in metres and size of conductor in B. and S. gauge.

$$\text{Then } I = \frac{E}{R + R^1} \quad \ldots \quad \ldots \quad \ldots \quad (1)$$

$$\text{and } U = E - RI \quad \ldots \quad \ldots \quad \ldots \quad (2)$$

Eliminating I between (1) and (2) we have

$$R = \frac{R^1 (E - U)}{U} \quad \ldots \quad \ldots \quad (3)$$

Assuming that we have n pairs of cords in use and that the average resistance of a cord circuit is r, then

$$R^1 = \frac{r}{n} \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (4)$$

Substituting this value in equation (3) we have

$$R = \frac{r (E - U)}{U} \times \frac{1}{n} \quad \ldots \quad (5)$$

Let L = the distance in kilometres between the exchange and the private branch exchange.
r^1 = the loop resistance of a pair of wires of a certain gauge 1 kilometre long.
R = the permissible resistance of the power leads.
N = the number of pairs of wires required to arrive at the resistance R for the power leads.

$$\text{Then } R = L \frac{r^1}{N} \quad \ldots \quad \ldots \quad \ldots \quad (6)$$

Eliminating R from equations (5) and (6) we obtain

$$N = n \times \frac{r^1 U L}{r (E - U)} \quad \ldots \quad \ldots \quad (7)$$

In this equation the quantity

$$\frac{r^1 U}{r (E - U)}$$

is a constant for given values of r^1, r, E and U.

This formula will allow us to trace the straight lines showing the relation between the number of pairs of wires to be used and the number of pairs of cords in use for different values of L.

These straight lines are shown on the right-hand side of the diagram, Fig. 1, they are traced for values of L varying from 100 metres to 2,100 metres, for r^1 = 108 ohms, which is the resistance

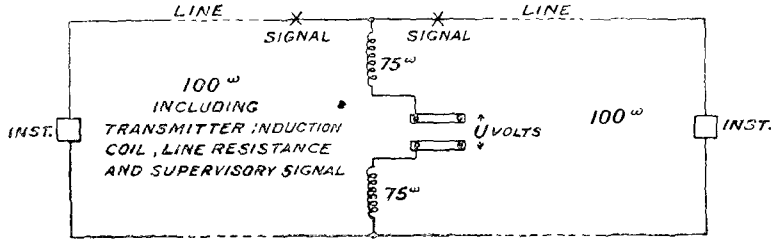

FIG. 2

of a kilometre loop of No. 22 B and S copper wire, for E = 22 volts and U = 14 volts, and for r = 200 ohms, which has been taken as the average resistance of a pair of cords in use for a local connection as shown in Fig. 2.

The tracing of these straight lines is very simple. It is sufficient to calculate N for L = 100 metres, for instance,

$$N = \frac{n}{10{\cdot}58} = {\cdot}0945\, n$$

then making n equal to, say, 10, we find N = 0·945. The values of N corresponding to n = 10 for 200 metres, 300 metres, 400 metres, etc., will be 2 × 0·945, 3 × 0·945, 4 × 0·945, etc.; these points are marked on the ordinate of n = 10, and all the points joined to the intersection of the axes.

Let us suppose now that for a given distance the conditions of voltage both at the exchange and at the private branch exchange are different to those used for calculating these straight lines.

Let E^1 and U^1 be the new conditions.

We have for the first case

$$n = N K \frac{(E - U)}{U} \quad \ldots \quad \ldots \quad (8)$$

and for the second case

$$n = N^1 K \frac{(E^1 - U^1)}{U^1} \quad \ldots \quad \ldots \quad (9)$$

In these formulæ the constant

$$K = \frac{r}{r^1 L}$$

Eliminating n, between equations (8) and (9) we have

$$\frac{N^1}{N} = \frac{\frac{E - U}{U}}{\frac{E^1 - U^1}{U^1}} \quad \ldots \quad \ldots \quad \ldots \quad (10)$$

$$\text{and } N^1 = N \times \frac{\frac{E - U}{U}}{\frac{E^1 - U^1}{U^1}} = N \frac{K^1}{\frac{E^1 - U^1}{U^1}} \quad \ldots \quad (11)$$

This formula will allow us to trace the straight lines showing the number of pairs of wires to be used for different voltages at the exchange and at the bus-bars compared to the standard voltages of 22 at the exchange and 14 at the bus-bars, the constant K^1 being 0·5714 for these particular values.

These straight lines are shown on the left-hand side of the diagram, and are traced for several conditions.

Now that we have traced these straight lines we are in a position to find at once the number of pairs of wires to be used for any distance, any number of pairs of cords in use and any voltage requirements, but before explaining the use of this diagram, we will see what is the equivalent, expressed in the number of cord circuits engaged, for a connection between two extension sets, for the operator's set, for a cord circuit engaged on a connection to a magneto exchange and for a cord circuit engaged on a connection to a common battery exchange.

The resistance of the operator's set, including the retardation coil, may be taken at 225 ohms, and may be considered equal to

$\frac{200}{225}$ = 0·9 of a cord circuit engaged on a local connection.

The resistance of a cord circuit engaged on a connection to a magneto exchange may be taken at 250 ohms, and corresponds then to $\frac{200}{250}$ = 0·8 of a cord circuit engaged on a local connection.

The resistance of a cord circuit engaged on a connection to a common battery exchange may be taken at 1,000 ohms (this resistance being that of the cut-off relay of the cord circuit), and corresponds then to $\frac{200}{1000}$ = 0·2 of a cord circuit on a local connection.

The number n to be used in the reading of the diagram is then

$$n = n^1 + 0{\cdot}9\, n^{11} + 0{\cdot}8\, n^{111} + 0{\cdot}2\, n^{1111} \quad \ldots \quad (12)$$

where n^1 = number of cord circuits engaged on local connections,
n^{11} = number of operators' sets,
n^{111} = number of cord circuits engaged on connections to magneto exchanges,
n^{1111} = number of cord circuits engaged on connections to common battery exchanges at the same time during the busiest hour of the day.

Suppose now that a private branch exchange of two operators' positions is 500 metres from the exchange, and that ten cord circuits are used for local connections, three cord circuits to magneto exchanges, four cord circuits to common battery exchanges, and that the exchange voltage is 22 volts and the voltage required at the bus-bars is 14 volts.

Then $n = 10 + 0{\cdot}9 \times 2 + 0{\cdot}8 \times 3 + 0{\cdot}2 \times 4 = 15$.

The number of pairs of No. 22 B and S copper wires is therefore just over seven, as shown by the dotted lines on the diagram (Fig. 1).

Supposing now that in order to improve the transmission we desire 16 volts at the bus-bars, the number of pairs of wires will then be between ten and eleven.

It is sometimes the practice to supply the current to the private branch exchange from the 32 volt meter battery. In that case, if the exchange battery voltage is 22 volts, condensers are inserted between the exchange line and the private branch exchange cord circuit, so that the supply for an exchange connection is from the bus-bars of the private branch exchange and not from the exchange, in that case formula (12) can be simplified to

$$n = n^1 + 0{\cdot}9\, n^{11} + 0{\cdot}8\, n^{111} \quad \ldots \quad (13)$$

n^{111} being the number of cord circuits engaged for connections either to magneto or common battery exchanges.

Suppose that a private branch exchange of one operator's position is 1,600 metres from the exchange, and that

Five cord circuits are used for local connections,
Four " " exchange "

and that the exchange voltage is 32 volts and that required at the bus-bars is 14 volts, then

$$n = 5 + 0{\cdot}9 + 0{\cdot}8 \times 4 = 9{\cdot}1.$$

The number of pairs of No. 22 B and S copper wires is just above six.

If 16 volts are required at the bus-bars the number required is nearly eight.

If No. 19 B and S or No. 16 B and S copper wires are to be used, the number of pairs is respectively one-half or one-fourth of

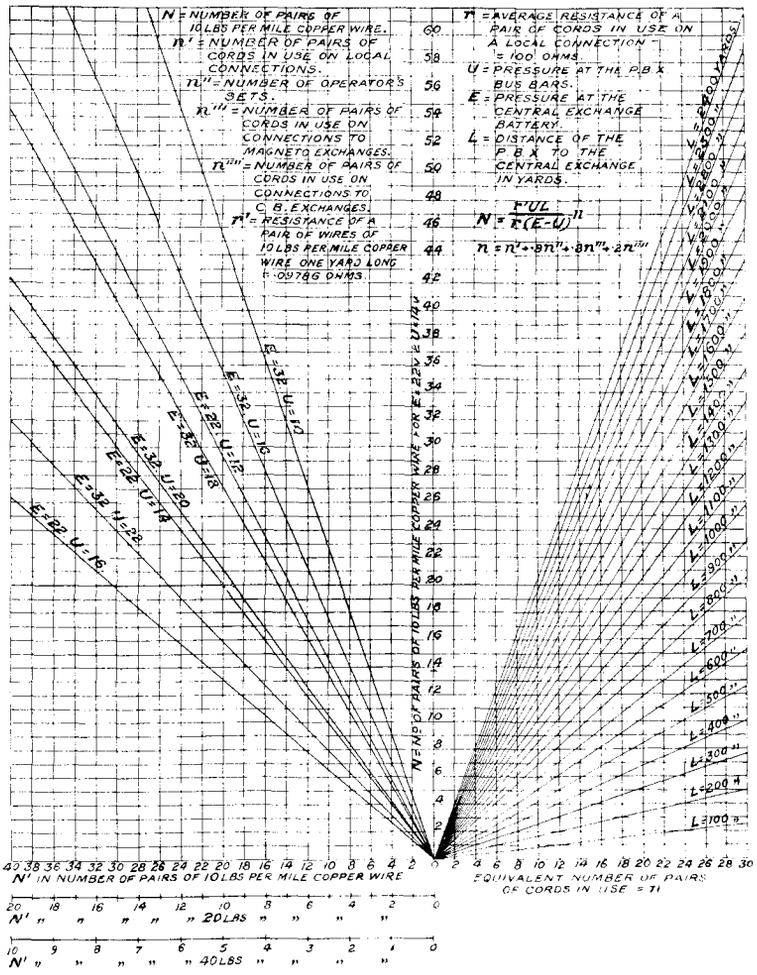

FIG. 3

Pairs of wires required for private branch exchange power leads. Distances given in yards and weight of conductor in lbs. per mile.

the number found. The abscissæ on the left-hand side of the diagram are divided in pairs of No. 19 and of No. 16 B and S as well as of No. 22 B and S.

It is evident that this axis can be divided in units corresponding to pairs of any size cables, using a method similar to the one described before, leaving everything constant in formula (7) except r^1, and comparing the different values of N^1 with corresponding values of r^1.

Supposing now that a private branch exchange is at, say, 2,200 metres from the exchange, and that it is the intention to use No. 19 B and S wire underground in a length of 2,050 metres from the exchange to the main cable box near the private branch exchange, 100 metres of No. 16 B and S twisted pair rubber-covered wire from that cable box to a cable box inside the building where the private branch exchange is installed, and 50 metres of

No. 22 B and S from that cable to the switchboard. The distance L to be used for determining the number of pairs of wires will then be

$$L = \frac{2050}{2} + \frac{100}{4} + 50 = 1100 \text{ metres.}$$

If the conditions of voltage and number of cords in use are the same as in the preceding example with 14 volts at the bus-bars, the number of pairs of wires will be just above four pairs of No. 22 B and S for the equated length L, that is to say that the number of power leads for the full distance 2,200 metres will be just over four pairs of No. 19, four pairs of No. 16 and four pairs of No. 22. The safe number of pairs of No. 19 should be five, but it can be seen easily that if in the preceding example the number of pairs of No. 19 is kept to four, but the number of No. 16 pairs and of No. 22 pairs is doubled the equated distance will be

$$L = \frac{2050}{2} + \frac{100}{8} + \frac{50}{2} = 1062{\cdot}50$$

and that for this distance the number of pairs of No. 19 B and S required is just under four.

This shows that by increasing the number of pairs of short lengths of No. 16 and No. 22 wires a very long pair of No. 19 B and S in the underground cable has been saved

In order to always keep to the standard of transmission for all the private branch exchanges connected to an exchange monthly reports of the number of pairs of cords engaged in the various connections can be sent to the person in charge of this service who can see if more pairs of wires are required.

All the above calculations are made in metres and in B and S gauge, but as the formulæ are quite general they stand good for yards and pounds per mile gauge, and everyone interested can trace diagrams for their own requirements. Fig. 3 shows a diagram drawn out on the basis just mentioned.

SWITCHBOARDS—PAST AND PRESENT.

By JOHN E. STANTON, *Nottingham Factory.*

(*Continued from page* 37.)

[It should be noted that in the text of page 36, second column, last line of third paragraph, "Fig. 11" *should be read* for Fig. 10. "Fig. 12" *should be read* for Fig. 11, six lines from bottom of same page. On page 37, "Fig. 13" *should be read* instead of Fig. 12 in second paragraph, column one, and "Fig. 14" instead of Fig. 13 in the fourth line of column two.]

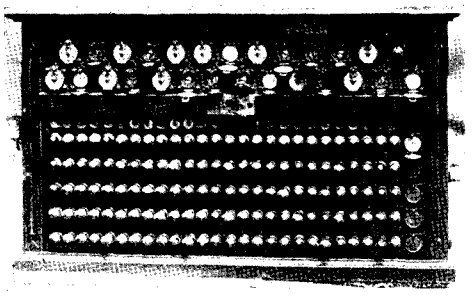

FIG. 14.

MULTIPLE SWITCHBOARDS.

I BELIEVE the first multiple switchboard was designed by Mr. Hawes, the United Company's electrician, and was familiarly called the "Horse (Hawes) Trough"; it was erected at the Company's Head Office, Oxford Court, which was known as the "Central Trunk Exchange." It was, in the words of the then Managing Director, the late Mr. J. B. Morgan, "an exchange of exchanges," or junction centre. Prior to this, exchanges had been springing up all round London, and each were provided with direct junctions to the other; it was felt this was an uneconomical way of handling the traffic, as it was frequently found that all junctions from, say, "Coleman" to Albert Docks were engaged, while probably those from Leadenhall were available, and so the longer circuits to outlying exchanges were transferred to the "Central."

I have not a photo of this board, but it was made up of strips of 100 small pattern slippers, mounted vertically, three rows parallel to each other, the frame being fitted on a table; the outgoing junctions terminated on the slippers, and incoming on cords and jacks (plugs) suspended above the slippers in a canopy; the whole arrangement was very similar in appearance to the flat type of board which came some years later. Three of these sections were fitted one behind the other, the slippers being multipled on each. The method of operating was as follows:—Each section had a number of incoming junctions and a "speaking" line from certain exchanges; suppose a subscriber on "Coleman" wanted a connection with a subscriber on Eastern, the originating operator would intimate the fact to their own "speaking" line operator, who would ring Central and ask for Eastern; the Central operator would repeat the request to the switching operator who would select a disengaged junction, then buzz (test) the Eastern junctions and having obtained a disengaged line, make the connection and quote the number of the selected junction to the speaking line operator, who repeated it back to the originating operator who quoted it to the switching operator, who in turn connected the junction to the originating operator's position, this operator would then ring, and getting a reply from the Eastern, ask for the number required. This system appears very crude to us at the present day, but it must be remembered it is over twenty years ago since this method was in operation.

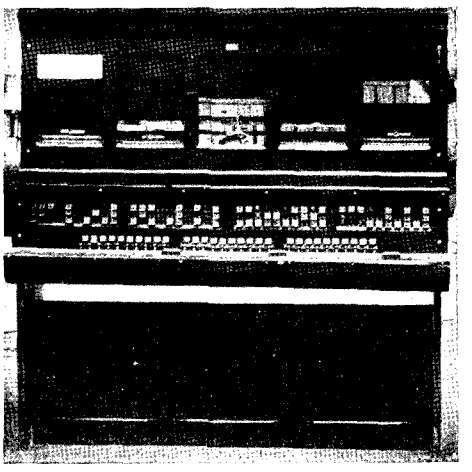

FIG. 15.

The system of "buzzing" or testing at this period is worthy of mention. It must be remembered the switching operators had no instrument, they simply received and gave verbal advice to the "speaking" table operator, therefore, to enable them to test, an ordinary electric bell or buzzer circuit was provided, to one side of which a flexible cord was fitted, and this terminated on an ordinary thimble, which the operators wore on the finger; the other side was taken to a contact, which completed the circuit, to a round-head screw fitted in front of each slipper, when a jack (plug) was inserted in any line, thus when the operator tested an engaged line, the bell or buzzer rang.

It is interesting to mention at this date that no clearing signals were fitted at this exchange, once a connection was made it was left on until "tapped off," and for this purpose two or three operators were constantly engaged on each section "tapping" lines.

Fig. 15 is a photograph of an old section which forms part of a 1,440-line exchange equipment. It is fitted with Dewar keys, and the connections and method of operating are the same as I have already described on the 50-line board.

I have now given you a fairly good sample and description of some of the old types of switchboards. No doubt there have been other designs brought out from time to time by various makers, but the principles of working have been the same.

All the boards that have been shown were on the earth circuit system, only one wire being used, and mother earth acting for the return circuit, but there is no doubt that the metallic circuit system is responsible for the leaps and bounds by which telephony has

advanced during the last ten or twelve years, and all the modern boards which I propose to show are, of course, of that type.

We will take the magneto system first ; this has been in use several years, and Fig. 16 shows the standard 100-line board used for small exchanges. It has 100 ordinary subscribers' lines, ten incoming and ten outgoing junctions.

The two-line wires are joined on to tabs, which are fitted inside the top panel ; they are then taken on to the two outside springs of

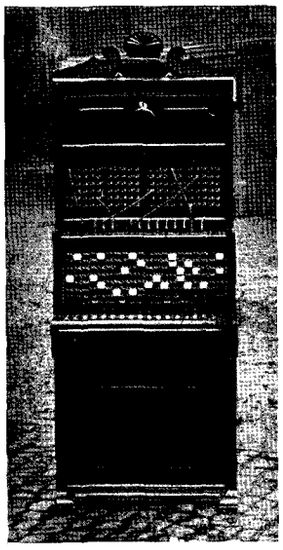

FIG. 16.

a spring jack. These two springs normally make contact with two inner springs, which are connected to the indicator. The cords are quite separate from the line circuits, and run in pairs, being joined together by means of a Kellog or Beam vertical key. For all practical purposes these keys are the same although greatly different in design. The following is the process of a call :—The indicator falls, the operator takes the answering plug, and puts it into the

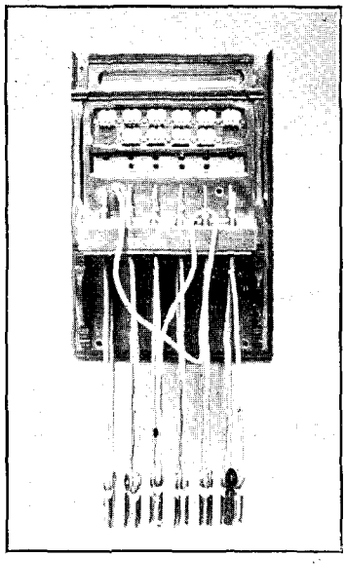

FIG. 10.

jack of the same number as the indicator (this cuts the indicator out of circuit). She now puts the corresponding key of the cord used into the listening position; this puts the operator's instrument direct to line. She asks the number required and puts the calling plug of the pair in the required jack, pushes the key back into ringing position, which puts the generator direct on to the subscriber wanted, and then leaves the key in the centre position, which puts the two subscribers in direct communication. When finished, the subscriber gives a short ring, which drops the ring-off indicator which is left across the lines. The operator then withdraws the plugs.

Fig. 10 also shows the latest wall-pattern switchboard, and is so wired as to be adaptable to either magneto or common battery working. For magneto working the connections are practically the same as in the case of the old boards, which I have already

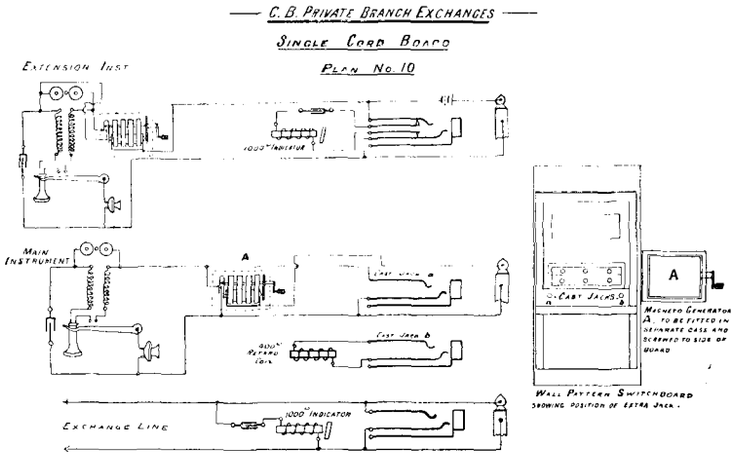

FIG. 17.

mentioned, with the exception that two wires are used instead of one wire and earth. For common battery working the connections are somewhat different, as you will see by the diagram (Fig. 17). Briefly, the exchange rings up through condenser and indicator, the use of condenser being to stop the 24 volts continuous current which is always on the line. The cast jack "B" is for the main operator's instrument. The cast jack "A" for holding the exchange line while main is conversing with an extension.

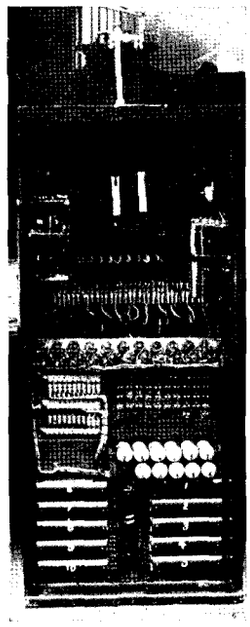

FIG. 18.

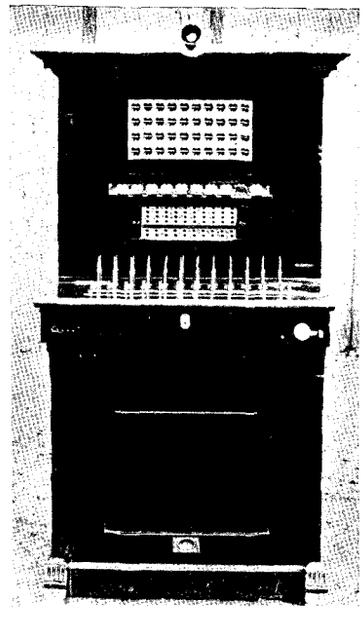

FIG. 19.

I show you two photographs of common battery switchboards (Figs. 18-19), but shall not attempt any explanation as this subject is well worth a paper to itself.

I wish to express my thanks to Mr. E. A. C. Sandy and Mr. J. B. Ryall, who have been good enough to assist me in getting together some of the information with regard to the old switchboards.

CORRESPONDENCE.

THE LIFE OF A WORKS ORDER.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

MR. G. W. BROMHEAD'S article on "The Life of a Works Order," in addition to being a lucid and interesting essay, is almost unique, in that it recognises the existence of a Contract Department, and, if possible, a more rare feature—it has a *soupçon* of wit. I have frequently noticed that any allusion to the former is strictly refrained from. Even Mr. Parsons, of Brighton, does not include us in his wheel, although he makes a point of the necessity of non-independence of departments. Perhaps he is right, for as I view it a wheel is of very little use without something to make it go, and there is no doubt that the Contract Department is the motive power.

Of course we know that contract people have very little to talk about in the JOURNAL, but give them a man without telephone service and see if they can't make use of their mother tongue. What remarks would be made by the General Superintendent I wonder on the subject of the 1,480 Form if Contract Departments suddenly ceased to be and the old happy-go-lucky system were reverted to.

No! You must not disguise the fact that these individuals exist and are a power in the land. People will not come to you and ask you to kindly connect them to the system (unless they have no intention of paying) in these days of advertising and hustle. You have got to treat the public like a child with medicine—take it on your knee, hold its nose and pour the concoction down its throat. *En passant*, I am aware that all children do not require such forceful methods, and it is sometimes quite a pleasure to meet a man who is willing to concede that a telephone is now necessary for him. Your contract men have to make up their minds that they are selling a good thing and go out and shout about it.

Think for a moment how you would verse yourself in diplomacy before going to interview a managing director about a private branch exchange that he, not having an expert view of the matter, thinks he can do without. You would require your very best arguments concisely offered and in their proper sequence, gradually leading him up to your conviction that the proposed installation is absolutely necessary for the welfare of his business. If you could bring your interview to a successful issue, you would become there and then a contract officer in effect and as much entitled as I to ask for your department to be sometimes remembered when departmental co-operation is on the tapis.

W. STANLEY COULSELL, Contract Department, Portsmouth.

[We are at a loss to understand Mr. Coulsell's grievance. Articles on Contract Department work have frequently appeared in the JOURNAL, especially in the first two years. Apparently Mr. Coulsell is a new subscriber, but even so he will have seen an article on "Contract Getting" and a lengthy correspondence on a departmental question in the last few numbers. Mr. Parsons' lecture, which was much abridged, contained several references to the Contract Department in its original form.—ED., "N. T. J."]

TEAM WORKING.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

IN the letter by the Misses FitzGibbon, Short and Manning in last month's JOURNAL, it seems to me that they have not followed their arguments to their logical conclusion.

Taking the regiments of an army; if each regiment were to strive to reach the enemy first they would upset the plans of the commander-in-chief and would further defeat their own ultimate object, that of defeating the enemy, by breaking up the line and leaving gaps through which the enemy could penetrate and attack them in the flanks and rear.

Again, taking a boat race or a football league. The *only* object of the separate boats or teams is to beat the others, and they are under no obligation to help each other, whereas the divisions in an exchange are like the individuals composing the teams, whose object is each to help the other individuals in his own team so as to give the best results as a whole; they cannot do this if each is striving to do the most work, as each man then has no time and little inclination to help his neighbour.

Following out the same simile, the teams are rewarded proportionately to their places in the finals by prizes of different values; I do not think, however, that the operating staff would like to be paid in proportion to the results obtained by the divisions, especially in view of the different loads and conditions at different parts of the switchboard, which cannot always be completely overcome.

Then as regards the value of competition between exchanges. These ladies apparently consider that there is not sufficient stimulation in this, because of the differences in equipment, load, etc. Although this is true in the sense that each exchange cannot compete on equal terms with every other exchange, it is like a mixed race where, though all run together, prizes are offered in a number of classes for, say, boys of different ages. Although the younger boys cannot expect to beat the best of the seniors, they compete against others of their own age, and have the hope, which is often fulfilled, of beating the slower runners amongst the seniors.

The comparison which these ladies institute between the varying loads, etc., on different exchanges and those on different divisions is not fair, as the exchanges are in pure competition to give the best service and cannot help each other (except in the "B" operating, which does not affect the relative figures of merit), whereas the divisions have to help each other by team work.

The last paragraph of last month's letter, if it is meant seriously, shows rather a want of proper spirit, but I think I may assume that it is merely a controversial argument, which the writers themselves do not really believe in. Surely operators are interested in their work for its own sake, and not merely for the chance it gives them of trying to be ahead of someone else. Team work in itself, and not competition between divisions, is the real factor in promoting efficiency and a spirit of comradeship.

Engineer-in-Chief's Office, May 5. W. DUFF STEWART.

OFFICE WORK AND ITS RELATION TO THE STAFF.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I HAVE a guilty feeling that anyone reading the above paper on "Office Work" in the May issue of the JOURNAL must have thought that the local offices in the Sussex district are in a very sad state of inefficiency. However, one must admit the paper brings home many home truths; but a number of statements have been made which, without explanation, may convey some very wrong impressions, and since these statements have been circulated through the medium of the JOURNAL throughout the Company's staff I feel that in fairness to those concerned some corrections are necessary.

Reputations take a long time to make, but very little time to spoil, in the same way that a lifelong character of good work can be spoilt by one act of folly. Now we should all appreciate having our errors pointed out, as it makes better men of us; but dubious statements ought not to be circulated broadcast unless the accused parties are given the same facility to offer their explanations, as any statement made at a telephone society's meeting is quite a different proposition to that of circulating the same statements in the JOURNAL.

To deal with the points to which objection is raised:

Labour Slate and Man-Hours.—Now, in theory, this is a splendid method of checking expenditure, the essence of the method being that we are able to see how the money is spent as the works proceed. But what obtains in practice in these days of modern cable distribution with numerous distributing poles and small areas of distribution?

Recently I took a record of 90 works orders, and on 82 of these the cost was under 50 man-hours each, the remaining eight being over 50 man-hours. Now, I would ask, how would the labour slate have helped at the time to stop any unnecessary, or, let us say, excess expenditure on the 82 works orders? It is obvious that any economy would only be effected by outside supervision on the spot during the time the money was being spent, and for such jobs I contended that the labour slate had not served its object beyond being a convenience for recording the man-hours, until such time as the figures were transferred to the works order, and for this purpose it is necessary. It would be interesting to hear the views of others on this point. Consequently, in the case quoted in the paper, not much harm would have have been done if the twenty man-hours estimated were filled in afterwards. Now, this seems a bold statement to make, but may this not have been the case? The order may have been for an urgent line started the day the order was signed, and the estimated man-hours not obtainable before the work was commenced. Work in towns with competition is quite a different thing to work in towns without competition, and it is a case of the early bird getting the worm, and not being too particular how you get it, so long as you do get it. The local office clerk was, according to Service Instructions, wrong in suggesting to fill in the man-hours, but why was he asked to? It was not his duty to estimate the time to be spent?

Monthly Estimates.—The case of the eleven applications for an item of revenue expenditure seems to be to the credit of the office concerned, inasmuch as it was deferred until it was rendered unnecessary. It was not stated why it was applied for on the first occasion; was it a bogus case? No, but possibly many readers of the JOURNAL can discern what was the nature of the trouble, and the solution; it is not public information. May I suggest this cardinal point? Never be too anxious to spend money or remove plant; the bolt may drop at any time, but circumstances may alter; there are other officers than contract officers who have to have a little perseverance, and we may have had one at the time.

Stores.—With regard to the suggestion that the wire recovered on line repairs should practically equal the amount taken out, this seems sound until it is analysed. Are we to understand the linesman will know the exact length of the span he is going to repair, and then take out sufficient wire to replace it, or is it to be balanced up monthly? I assert neither is practicable. Besides, when the faultsman arrives at the job he may find that someone else has found that copper wire has got its good points.

Expenses and Gang Sheets.—The statements made apparently reveal a most extraordinary state of affairs, and it would appear that more attention had been paid to the quantity of initials and ticks that could be placed on the sheets rather than the security which such initials should indicate; but, since "they were all wrong," it suggests the statement was made in the same spirit as some of our present-day politicians air their views on a multitude of subjects, for I claim there is some little distinction between a man who cleans a window or winds a clock and one who cleans windows and winds clocks. If we are to have the facts, we ought to have all of them.

Overtime.—This is another point deserving of explanation; it is agreed men don't often omit to record what is due to them. Now, the pay roll is made up on Thursday, and the ordinary time for that day has to be estimated on the certification of the engineer; but he cannot say what overtime will be incurred for that day. Consequently it must be passed through the following week, and this would seem to be a justifiable procedure, and further, this arrangement was devised by the district office to enable the pay roll to be completed on Thursdays.

Now that the reader has got so far, I can fancy I hear him say the paper in question had found a billet. It has, and its points are appreciated; but it contains so many burlesque points that it is feared if the paper is treated seriously it may convey some very wrong impressions of the merits of the staffs of the local offices in the Sussex district, and as they have been quoted on so many points in the paper, for this reason I venture to ask your kind indulgence to insert this explanation in the JOURNAL.

Brighton, May 12. F. W. ROBERTS, Local Manager.

[One or two letters are held over until next month owing to pressure on space.]

THE NATIONAL TELEPHONE STAFF TRANSFER ASSOCIATION: CENTRAL COMMITTEE.

THE recent general election in connection with the appointment of a new central committee resulted in ihe following thirteen members being returned at the top of the poll :—

Alsop, V.	Head Office.
Barnett, W.	Head Office.
Bold, W. R.	Head Office.
Corner, H. G.	Metropolitan.
Lowe, L. H.	Metropolitan.
Pugh, A.	Oldham.
Roberts, F. W.	Brighton.
Scott, J.	Birmingham.
Sibley, C. H.	Nottingham.
Stirling, J.	Metropolitan.
Tattersall, C. E.	Metropolitan.
Valentine, W. A.	Glasgow.
Watts, A.	Head Office.

The following members received the highest number of votes from their respective provinces :—

Alsop, V.	Head Office.
Corner, H. G.	Metropolitan.
Currall, P.	Ireland.
Pugh, A.	North-Western.
Roberts, F. W.	Southern.
Sibley, C. H.	Midland.
Stewart, J. W.	Scotland.
Sutcliffe, H. B.	Northern.
Waite, B.	Western.

And, in accordance with the resolution to that effect passed by the late central committee, the following four gentlemen became members of the central committee as representatives of their respective provinces, the other five provincial representatives being already members of the Committee :—

Currall, P.
Stewart, J. W.
Sutcliffe, H. B., and
Waite, B.

The fact that the numbers of votes given was far in excess of those given at any previous election, and that, since the beginning of the year, over 1,100 new members have been enrolled, goes to prove that the interest in the work of the association is not only healthy but very much on the increase.

The first meeting of the central committee so appointed was held at Anderton's Hotel, London, on Wednesday, May 19. The whole of the retiring officers were unanimously re-elected, viz. :—

Chairman	W. A. Valentine.
Vice-chairman	V. Alsop.
Principal secretary	E. A. C. Sandy.
Hon. treasurer	J. Leslie.
Hon. auditors	Eustace Hare and Jas. W. Campion,

a special vote of thanks being passed to the latter for their services during the past year.

Executive committee: Messrs. V. Alsop, W. R. Bold, L. H. Lowe, J. Scott, and W. A. Valentine.

The work done by the various local committees having been reported, Messrs. W. Barnett, H. G. Corner and A. Watts were appointed to act as a press committee, with instructions to invite three members of the Metropolitan local committee and three members of the Head Office local committee to act with them as a joint committee.

Messrs. W. Barnett, L. H. Lowe and J. Stirling were appointed as a sub-committee on local organisation with power to make suggestions to local committees, such suggestions on being agreed to by the local committees to have the force of a resolution of the central committee itself. Any difference between the sub-committee and a local committee to be referred to the central committee.

The question of the possibility of an earlier purchase of the Company's plant was fully considered, and a resolution asking for protection of the staff was unanimously passed, and a copy thereof, signed by each member of the committee, delivered to the President of the Company.

A large amount of other business was transacted, including the consideration of resolutions from various local committees, and a full report of the meetin will be circulated to the various local committees with the least possible delay. ERNEST A. C. SANDY, Principal Secretary.

LONDON NOTES.

BY an oversight, no report of the Metropolitan staff dinner, held on April 2, was sent for last month's JOURNAL. Mr. Clay presided over an attendance of 170. The committee selected Frascati's for the gathering, and the excellence of the dinner justified the choice. The musical programme also was of a high type. The chairman made some interesting references to the work and changes of the year. Mr. Goddard voiced the sympathies of the Directors and Head Officers with the members of the staff in their anxiety as to the future. Mr. Goddard's definition of a private line as "one over which a man spoke to himself" (*vide* House of Lord's decision), was much appreciated. Mr. Greenham made the hit of the evening when, in proposing the chairman's health, he quoted the line from *Hamlet*: "Imperious Cæsar dead and turned to *Clay*." Another illustration of the advantage of taking a sentence from its context.

FOREMAN HART, of the Western district, who passed away recently, had been in the service since 1880. His father had also been in the Company's service, and had been a foreman for ten years. The deceased foreman was held in high esteem by the officers under whom he worked, and what is no less high a test, he secured the best regard of the men whom he controlled. Such a tribute at the end of 29 years' service is the best testimony to Foreman Hart's worth. Our deepest sympathies are with his relatives in their loss. Mr. J. L. Brown, Western Divisional Engineer, represented the Company at the funeral.

THE Metropolitan stores offices have now been transferred to Dalston, so that extra accommodation may be provided for the other departments at Salisbury House. It may not be amiss to say a word as to the up-to-date completeness of the Dalston premises into which the Dalston Exchange was moved on May 15. The accommodation and plant generally are said to be the "last word" on a modern telephone building. The change-over was accomplished without a hitch, and the engineering and electrical staffs are to be congratulated on the successful result of their labours. One amusing incident was noticed in the switchroom. The old Dalston board was fitted with hand-restoring indicators, and one operator at the new board, which is, of course, fitted with lamps, was noticed extending her finger as if to replace the signal when a "P. G." developed on one of the lines. Although Gerrard must always be regarded as the show place amongst London exchanges, there are features of much interest at many of the other London centres. In particular, the workshops at Dalston are deserving of their meed of praise, and may even give points to the "powers that be" at Nottingham.

DURING the sunny weather with which late April favoured us, one would have thought it impossible to get more than a small attendance at any indoor evening gathering in the City. The energetic committee of the Bank Exchange, however, succeeded in filling about 45 tables for their last whist drive of the season at the Mecca Café on April 22. The proceeds went to the Lifeboat Fund. Mr. Davis presented the prizes in his usual affable manner. The winning of two prizes by the Misses Knapman and the awarding of the "booby" to Mrs. Knapman, caused a good deal of fun. The Bank staff are to be congratulated on the success of their efforts, and the zeal which they have shown in the cause of philanthropy throughout the winter.

THE Clay Challenge Football Cup has returned to Salisbury House, the final having been played with the Northern district on April 17. The winners secured a 5 to 2 victory, the teams being one goal each at half time. We congratulate the victors. Next year the committee might advertise the match a little more freely, and endeavour to secure the attendance of a few of the chief officers. A word of praise is due to the rival captains, H. B. Taylor, Salisbury House, and C. A. Blassom, North.

THE London Telephone Society at its annual meeting on April 28 elected Mr. L. Harvey Lowe, Assistant Metropolitan Superintendent, as president. We congratulate both the society and Mr. Lowe and wish for them a prosperous year. The session just closed opened well, but there was a deplorable falling off in the attendance at some of the later meetings. The committee has been strengthened, and no doubt before the new session opens they will consider ways and means for increasing interest in the meetings and securing larger gatherings. If some arrangement could be made whereby those desiring to take part in discussion could know in advance the principal points to be touched upon by the lecturer more profit might result; desultoriness and a lack of point and "go" have sometimes been too prominent. The reduction of subscription and abolition of the entrance fee should lead to a large accession of members; an effort should be made to realise this. The decision to form a traffic branch also should make the society popular with all the traffic staff. Great things are expected from the new branch.

THE honours in the telephone society's junior competition were secured by two of the Engineer-in-Chief's staff at Head Office. Mr. H. G. Bishop took two prizes for his papers on "Office" and "Operating" respectively. The latter dealt entirely with the recording of calls. It gave a brief and very clear account of the register and ticket systems, with various hints as to the securing of the highest efficiency at the lowest cost. Mr. Bishop's other paper had for its title "Efficiency in Office Work." The qualities necessary in an office chief and his staff, the proper lay-out and adequate equipment of an office, were the principal points touched upon. One is rather inclined to disagree with Mr. Bishop's dictum that "Humour is out of place in an office, and lowers the efficiency by causing familiarity between chief and staff. A serious demeanour, whether natural or assumed, is productive of the best results." Is it not rather dangerous to lay down principles of this kind on the basis of a partial truth? Humour and the sense of it are the salt of existence; a chief who allows humour to beget license is lacking in some of the other qualities which Mr. Bishop sets out in his paper. The prize on office work was awarded to Mr. L. J. Farries, for his paper entitled "Some Qualifications of a Clerk." A few of his points were :

(*a*) "Catch your clerk young."
(*b*) "Hope of promotion is an incentive to juniors."
(*c*) "An examination should be passed in arithmetic, spelling, and composition."
(*d*) "Shorthand useful but not essential."
(*e*) "Literary knowledge and knowledge of current events implies intelligent application of mind."

All three papers were of a very high order. A special prize was awarded to Miss Hooper, Clerk-in-Charge, Hammersmith, for a paper dealing with Mr. P. T. Wood's lecture on "Apparatus."

WHEN all the new premises which the Company have at present in course of construction in London are finished, we shall have a group of exchanges which will bear comparison with those of any other large city. Apart from Dalston, to which reference has already been made, it is hoped to change over at Bromley, New Cross, Streatham and Walthamstow during this year, and at Lee Green in the early part of next year.

THE general meeting of the chess club was held on April 27, with Mr. L. Harvey Lowe in the chair. The secretary was able to present a satisfactory report of the first year's results. The total number of games played in matches was 159, of which 99 were in connection with the Civil Service and Municipal League. Thirty of these league games were won, 17 drawn, and 43 lost. The individual honours of the club were carried off by Mr. Harvey Lowe, his percentage of points to number of games played being 80. A new committee was appointed, and it was decided to run a club tournament next session, Mr. R. H. Carter being elected tournament secretary. Mr. R. P. Lowe, Eastern Divisional Contract Agent, has been re-appointed secretary and treasurer.

IT is of interest to note that the number of entries by the Company's staff at the various technical institutes in London for last season was 327.

J. S.

NEWS OF THE STAFF.

We regret to hear that Mr. H. DAVIS, Metropolitan Stores Manager, has been suffering from a severe attack of pneumonia. He is now making good progress towards recovery and desires to return thanks for the many kind enquiries made concerning him.

Miss MINNIE CATHERINE JINKIN has been appointed Travelling Superior in the Plymouth and not the Edinburgh district as reported in last month's JOURNAL. Miss A. C. FERGUSON has been appointed Travelling Superior at Edinburgh.

Miss E. MCCANN, Supervisor, Dublin, has been promoted to be Travelling Supervisor, Dublin district.

Miss J. MCCARTNEY, Supervisor, Belfast, has been promoted to be Travelling Supervisor, Ulster district.

Miss M. FITZPATRICK, Senior Operator, Cork, has been promoted to Travelling Supervisor, South of Ireland district.

Mr. T. RICHARDSON, Local Manager, Peterhead, has been promoted to be Local Manager at Elgin.

Mr. JAMES WARNOCK, jun., of Glasgow, has been appointed to the position of Local Manager at Peterhead.

Mr. D. HUTCHISON, Assistant Engineer, has been promoted to the London Study Department, Salisbury House.

Mr. E. STANLEY BYNG, A.M.I.E.E., of the Engineering Staff, Sheffield, has been transferred to London as Assistant Engineer, Brixton. Before leaving, the District Manager, on behalf of the staff, presented Mr. Byng with a gold watch-chain as a token of esteem and as an earnest of their best wishes for his future welfare.

Mr. J. H. RILEY, Sub-Engineer, Hull, has been transferred to Swansea in the same position. He was presented by the staff with a case of mathematical instruments.

Mr. J. W. EDMONDSON, Fault Clerk, Hull, on his leaving the Company's service, was presented by the staff with an interleaved interlinear Bible (his own request).

Mr. J. B. FULLER, Night Operator, Hull, has been transferred to Grimsby as Storekeeper.

Mr. ANGUS, late of the Metropolitan Service Office, has been promoted to the position of Chief Inspector at Kensington,

Mr. WILLIAM S. COX, Test Clerk, Central Exchange, Birmingham, has been transferred to Nottingham as Chief Inspector. On leaving Birmingham he was presented by his colleagues in the Electrician's Department with a handsome kit bag and case of pipes.

Mr. S. F. COLES, Inspector, Leicester, resigned the service of the Company and sailed for Canada on May 14. He was presented with a travelling rug by the staff.

Mr. J. HAROLD, formerly Linesman Inspector, has been appointed Test Clerk at Leicester, in succession to Mr. P. V. SANSOME transferred to Inspectors' Department.

Inspector D. C. JENNINGS, Canterbury, on leaving the Company's service for Canada, was the recipient of a cabin trunk, which was subscribed for by the whole of the Canterbury staff.

Miss A. COOPER, Senior Operator, Eastbourne, has been presented by the staff with a glove and handkerchief combination case and purse, on her resigning her position after nine years' service.

Mr. JOHN AKED, Local Manager, Durham centre, has been promoted to be Local Manager, Keighley. On leaving Darlington he was the recipient of a solid silver cigarette case, suitably engraved, together with the best wishes of the staff.

Mr. R. MOULT, Chief Inspector, Stockport, has resigned owing to ill-health.

Mr. W. SHEA, Local Manager, Stockport, has been transferred to a similar position at Southport. Before his transfer he was presented with a marble timepiece by the staff of the Stockport centre. The presentation was made by Mr. A. Pugh, District Manager, on their behalf.

Mr. J. RADFORD, Chief Inspector, Swansea, has been appointed Chief Electrician.

Mr. A. G. BRISTOW, Exchange Manager, Swansea, has been appointed Traffic Manager.

Mr. W. BOND, Clerk in the Local Office, Dewsbury, was presented by the Dewsbury staff with a portmanteau on his transfer to the District Office, Leeds.

Mr. A. L. BARCLAY, Exchange Inspector, has been promoted to the position of Traffic Manager at Aberdeen.

Mr. WM. STARK has been promoted from the position of Test Clerk to that of Exchange Inspector, Aberdeen, vice Barclay.

Mr. A. WILLIAMS, District Office Clerk, Cardiff, who has been promoted to be Stores Clerk at Swansea, has been presented with a shaving set in case, together with a pair of hair brushes.

Miss I. L. JONES, Junior Operator, Royal Exchange, Liverpool, on April 15, left the service to enter the nursing profession. The operating staff at the Royal Exchange presented her with a silver-backed hairbrush and comb.

Mr. H. CLYMA, Instrument Inspector, Wigan, was transferred on April 23 to Manchester, as Instrument Inspector.

Mr. A. SPARGO, Local Manager, Southport, was transferred to the Local Managership of Stockport on May 7.

Miss HELEN BURRELL, Junior Operator, Royal Exchange, Glasgow, left on April 8 to go to Canada. Before leaving she was presented with a gold bangle by the staff.

Miss ELIZABETH BAILLIE, Junior Operator, Argyle Exchange, Glasgow, left on April 3 to go to New Zealand. She was presented with a pearl pendant by the staff in Argyle Exchange.

London Traffic Department.—*Promotions and Transfers:*

Mr. J. JENKINS, Assistant Exchange Manager, London, has been appointed Exchange Manager of the newly-formed Dalston district.

Miss HENRIETTA SPEARING, who was recently appointed Travelling Supervisor for the City district, has been appointed Clerk-in-Charge at Cardiff. She leaves London with the best wishes of her colleagues for her success and happiness.

Miss ROSE MOSS, Senior Supervisor, Paddington, has been appointed Senior Supervisor-in-Charge, Harlesden.

Miss ANNA CASEY, Supervisor, London Wall, has been made Senior Supervisor, Paddington.

Miss MARGARET BOOTH, Supervisor, Avenue, has been made Senior Supervisor-in-Charge, Lee Green.

Miss EMMA GOODWAY, Supervisor, Avenue, has been made Travelling Senior Supervisor, North-East district.

Miss LILY GOODWAY, Supervisor, London Wall, has been made Travelling Senior Supervisor, City district.

Miss ELLEN INGRAM, Supervisor, Hop, has been made Travelling Senior Supervisor, South district.

Miss FLORENCE SCOWCROFT, Supervisor, Gerrard, has been made Travelling Senior Supervisor, Western district.

Miss LENNA HUTCHINGS, Operator, Hop, has been appointed Supervisor, Gerrard.

Miss ELIZABETH WILSON, Operator, Paddington, has been appointed Supervisor, Gerrard.

Miss VIOLET STRONG, Operator, London Wall, has been appointed Supervisor, Avenue.

Miss EMILY CASTLE, Operator, Streatham, has been appointed Supervisor, Hop.

Miss ROSE HILL, Operator, Bank, has been appointed Supervisor, London Wall.

Miss ETHEL TYE, Operator, Gerrard, has been appointed Supervisor, Avenue.

Miss JEANNETTE I'ONN, Operator, Avenue, has been appointed Supervisor, Bank.

Miss ALICE MIDDLETON, Operator, London Wall, has been appointed Supervisor, Bank.

MARRIAGES.

Mr. C. E. GILMAN, Inspector-in-Charge, Uxbridge, who was married on April 10, was presented with a silver teapot and cruet by the members of the Watford and Ware staffs.

Miss HELEN MCGEE, Senior Operator, Maryhill Exchange, left on March 11 to be married. She was presented with a silver double-jelly dish by the staff in her exchange.

Mr. J. C. DALZIEL, Senior Clerk, Kilmarnock, was presented by the Ayrshire district staff with a case of cutlery and with a silver photograph frame for his wife on the occasion of his marriage. The presentation was made by Mr. G. A. McDonald, District Manager.

Mr. W. BEATTIE, Local Manager, Wigan, was presented by the staff of the South-West Lancashire district, with a handsome oak roll-top desk, on the occasion of his recent marriage. The presentation was made at the Wigan local office by the Inspector-in-Charge, St. Helens, in the absence of the District Manager.

Mr. T. C. POTTS, Chief Cessation Officer, Western contract office, was presented with a handsome marble clock on the occasion of his marriage, which took place on April 24. The presentation was made by Mr. J. H. Bigland, Divisional Contract Agent.

Miss L. CHAPMAN, Clerk-in-Charge, Darlington, was presented with a clock and pair of salt cellars on the occasion of her leaving the Company's service in view of her approaching marriage.

Mr. J. HUDSON, of the Secretary's Office (Accountant's Department), was married on April 5 at Heaton Church, Frizinghall, to Miss Dolly Bickers. He was presented with a canteen of cutlery by his colleagues at Head Office.

OBITUARY.

By the death of GILBERT TAYLOR, Cash Office Clerk, Glasgow, who succumbed to pneumonia on May 10, after a brief illness, the Company has lost one of the most promising of its younger employees, and the Glasgow staff one of its favourite members. His was a bright and kindly personality, which, during a service of nearly four years, had endeared him to his colleagues, and will keep him long in their remembrance. As an outward mark of regard the office staff is arranging to place a memorial on his grave.

We deeply regret to announce the death of ROBERT GARDINER, who for five years served the Company in the Glasgow district as a clerk in the Engineer's Department. His death, due to consumption, occurred on April 15, after a very long illness A wreath was placed on his grave by his colleagues as a mark of the esteem in which he was held.

We regret also to announce the death of W. G. KNIGHT. He entered the Company's service in September, 1902, as a labourer, and in September, 1904, was given the position of Wireman in a Redhill gang. In May, 1907, he was raised to be second Wireman in the gang. In January last he was transferred on loan to the Sydenham centre, and on March 20 he caught a severe chill, which rapidly developed to double pneumonia. He was taken to the Cottage Hospital, but in spite of his splendid constitution he slowly succumbed, and on April 22, after remarking that he would take a little sleep and then go to work, he expired. Much regret was expressed by the men at the loss of a colleague, who had always been well liked and respected by them, and their sympathy with Mrs. Knight was expressed by a wreath which they sent.

LOCAL TELEPHONE SOCIETIES.

Hastings and Eastbourne.—The last meeting for the session was held on May 11 at the Y.M.C.A. Rooms, Havelock Road, Hastings. The number of members present was 33, including twelve members from Eastbourne, with Mr. R. Curling, the Local Manager. Mr. E. Armstrong (Local Manager, Hastings), gave an extremely interesting and instructive paper on "Maintenance Records of Overhead and Underground Work." An interesting discussion followed.

Dublin.—The final meeting of the 1908-9 session was held in the superintendent's office on April 28 when Mr. R. B. Graham, Inspector-in-Charge, gave a most interesting display of lantern slides which was much appreciated by the members present—*80 per cent. of the total membership.* Mr. Currall presided, and before the meeting dispersed gave the members the benefit of his opinion on the advantages of the telephone meetings as a means of promoting knowledge, and finally urged each and every one to take a keener and livelier interest in them for the future. It is satisfactory to note the average attendances for the past session was a considerable improvement on previous years.

Western (Metropolitan).—The 1908-9 session of this society terminated with a meeting held at Gerrard Exchange on May 6. During the past quarter *meetings have been held and the following papers read:*—

Feb. 11: "Central Battery from a Subscriber's Point of View," by Mr. R. Vignale, and "Exchange Inspector's Duties," by Mr. J. F. Bennett. These were very interesting papers, the former dealing with the various complaints made by subscribers and the steps taken to locate and remove the cause of their difficulties. Mr. Bennett's paper gave a *résume* of the duties of an inspector at a large central battery exchange, and made suggestions as to training and supervision.

March 11: "Induction Coils, Repeaters and Transformers," by Mr. G. H. Bryant. *This paper gave a good description of the types of coils in use, and* went deeply into the theory of the subject.

April 15: "A paper was given by Mr. F. H. Hayden, on "Central Battery Instruments," which illustrated the various circuits for extension working and the faults which sometimes occur on the apparatus.

May 6: Mr. E. W. B. How gave a paper on "Test Clerk's Duties," which briefly summarised the procedure in dealing with the connection of new lines, testing and localising faults, and keeping of the card records. A full discussion followed each reading and lantern slide illustrations were a feature of the March and April papers.

Leicester.—Mr. Leonard Price, president of the society, was successful in departing from traditional lines in his address to the members on April 23. His paper, consisting of replies to questions previously submitted, proved most interesting.

Luton.—Mr. S. J. Cain, Chief Inspector, Luton, read a paper entitled "Faults and Complaints," to a good attendance of the society, at Luton, on April 22, under the chairmanship of Mr. J. H. Wilson. Mr. Cain gave a graphic description of numerous and sometimes amusing complaints of the grumbling subscriber, and also successfully cleared, without the aid of a galvanometer, a number of faults put on a wall instrument by members of the electrical staff present. This was the seventh and last meeting of the session, which has proved in every way a successful one.

The election of officers for the session 1909 1910 resulted as follows:—President, C. C. Worte, Esq.; committee: Messrs. Cowburn, Gibson, Roach, Messrs. Greenwood, Honor, Murray, Nicholson, Pinnock, Sanderson and Tattersall; secretary, Mr. G. W. Campbell; treasurer, Mr. G. R. Hill; minute secretary and librarian, Mr. A. E. Pinnock; auditor, Mr. G. H. Cobby.

Newcastle.—The annual meeting of the above was held on April 27, Mr. F. W. Gaskins was in the chair. The minutes of the last annual general meeting were read and confirmed. The secretary's report was also read and confirmed. The report dealt with the meetings and attendance of the committee, the reasons for and the success of the branch at Sunderland, the books obtained for the library, changes in the rules, and conduct of the meetings, and of the policy of the society. Discussions on questions of moment were touched upon. The report concluded with a number of remarks on the question of papers and prizes, together with the discussion which should follow. The treasurer's report, which showed a good balance in hand, was read and passed. A goodly number of members were proposed for officers of the society, and the following were duly elected:—Hon. president, A. L. E. Drummond; president, J. Gwyther; vice-presidents, R. W. Jackson, F. W. Gaskins, E. T. Payne, J. P. Urwin; secretary, A. McEwan; committee, G. Marshall, C. W. Hall, W. H. Abbott, O. Preston, G. Tate, R. Bulman, H. Dent, J. Gilroy; auditor, F. Dickenson. It was decided to change the meeting night from the third Thursday to the first Tuesday in each month. The subscription will remain the same, with the exception that it will be refunded to those members who put in 75 per cent. of attendances. This is with a view to increase the average of attendances. The chairman suggested that a number of weekly and monthly periodicals could be circulated amongst the members, as was done in other districts by a book club. This matter was left with the committee. There was a good attendance, over 50 of past members and others of the staff being present.

Sunderland and South Shields.—The sixth and last meeting was held at Sunderland on April 2. Mr. J. G. Dixon presided. The paper was read by Mr. James Reay on "Method of Dealing with Faults by the Post Office." The speaker dealt with the following items:—How faults are dealt with; duties of officers from the engineer to the foremen; how stock and works orders are treated; what the duties of Company's employees may be when the Post Office take over the system.

STAFF GATHERINGS AND SPORTS.

Edinburgh.—*Ampère Golf Club.*—The annual general meeting was held on April 20. Office-bearers were elected and competitions arranged. The membership has increased to 32.

The competition for the Stewart medal took place on Musselburgh Links on May 15. The medal and badge were carried off by Mr. J. B. Haig (electrical), and prizes were won by Mr. J. Robinson (electrical) and Mr. S. R. McKenna (engineering). Mr. J. H. Allan (clerical) and Mr. R. Richardson (electrical) tied for the best scratch score prize.

Sheffield.—A very successful smoking concert was held at the Central Café on April 23. About 60 members of the staff and friends were present, and an excellent programme was thoroughly appreciated. Mr. R. C. Bennett presided, and there were also present, as representatives of the Post Office, Messrs. R. T. Vity and T. E. Herbert.

Birmingham.—The Birmingham Operators' Telephone Society completed the 1908-9 session with a social gathering and dance, which was held on May 1. There were over 130 members and friends in attendance. Fancy dress was a pleasing feature, and some pretty and amusing effects were in evidence. A programme of vocal and instrumental music was provided, and also a sketch, entitled *Cinders*, the whole being very much appreciated. Mr. C. W. Piggott fulfilled the duties of M.C., and presented prizes awarded for competitive papers to the Misses Bower, Braine, Joyner, Pool and Wright. A very pleasant and successful evening was brought to a close at 11.30 p.m.

Cambridge.—On May 17 a staff social gathering was held at the Dorothy Café, Cambridge. The proceedings included an excellently varied programme, embracing vocal and instrumental selections, as well as ventriloquism, conjuring and recitations, the bulk of the contributors being members of the Company's staff. The staff and their friends enjoyed a most successful evening.

Cardiff.—A cycling club has been formed amongst the staff here. The idea has been taken up enthusiastically, fifteen of the staff giving in their names at the first meeting, and it is expected that a very enjoyable season will be the result. The following officers have been elected:—President, Mr. Waite; vice-president, Mr. Duncan; captain, Mr. Lucas; vice-captains, Messrs. W. Davis and W. H. Aylesbury; secretary and treasurer, Mr. S. F. Whetton; assistant secretary, Mr. Reid. The first run took place on May 15 to Cowbridge, and, favoured with fine weather, was very much enjoyed.

Oldham.—The annual dinner of the South-East Lancashire Telephone Society was held on April 21, preceded by a general meeting and the election of officers for the coming session. The dinner was held at the Café Monico, Oldham. Thirty-six members and friends were present. Afterwards a smoking concert was held, there being an excellent programme, which was heartily enjoyed by all.

Plymouth.—The third annual staff dinner took place on Friday, April 23, at Chubb's Hotel, Plymouth. A company of about 40 sat down to dinner, and the chair was taken by Mr. G. Hooper, District Manager. Two toasts were proposed, viz.: "The King," by Mr. Hooper, and "The Chairman," by Mr. D. J. Meikleham. After dinner the remainder of the evening was devoted to a smoking concert, a very excellent programme being contributed to by the following members of the staff:—Messrs. Wran, Meikleham, Bennett, Griffiths, Roberts, Mullins and Harris. In addition to the above, a number of non-employees of the Company, comprising some of the best local talent, were also on the programme. All of these artistes, two of whom are members of the Post Office staff, were greatly appreciated, and a special vote of thanks was accorded them. The arrangements were carried out by Messrs. Bennett, Evans and Walton, who had the satisfaction of learning that a most enjoyable evening was spent by all present.

NATIONAL TELEPHONE PROGRESS.

EXCHANGES were opened by the Company during the past month at Wolstanton (Staffs) in the Hanley district, at Hadleigh (Suffolk) in the Ipswich district, and at Sutton (Dublin) in the Dublin district, making a total of 1,556; 2,318 new stations were added during April, making a grand total of 484,708.

Cheltenham.—A mercury arc rectifier and a set of C. E. S. accumulators have been installed and are now working here.

MR. J. T. COWELL, Local Director for the Isle of Man, has been appointed Receiver-General of the island.

ANNUAL STAFF DINNER (*concluded from page* 55).

sterling character which he had exhibited was worthy of their best admiration. (Cheers.) During the year that Mr. Mordey had been President he had achieved a settlement of the problem of a permanent home for the Institution of Electrical Engineers which was so much to be desired, and he had achieved it with very great success. ("Hear, hear.") He thought they sometimes forgot how much they owed to the Institution of Electrical Engineers. Remember, that the electrical engineering profession was the one by which they all earned their bread and butter, and it was that institution, and, of course, similar institutions, which had fostered the growth of electrical engineering generally. If they took away the work of those institutions, where would their cables, dynamos, storage cells, lamps and other things be? He did not think they would be in the state in which they were at present, and therefore it was with very great pleasure indeed that he associated Mr. Mordey's name with that toast, and he asked them to drink to the health of "Engineering," coupled with that name. (Cheers.)

Mr. W. M. MORDEY said that after-dinner speaking involved the idea of a preceding dinner, and a preceding dinner, like charity, blessed those who speak and those who hear. That night, he regretted to say, that he had missed two feasts. Other duties kept him from joining them earlier, so he had missed the pleasures of the table and also the pleasure of hearing the preceding speakers. But he was very glad indeed, although he came so late, to be there that night, because he felt that as an electrical engineer he was among friends. (Cheers.) He felt that among the telephone engineers of that great company he was among those who were doing some of the most important electrical engineering work in that country. Although he could not claim to be a professional telephone engineer, he might claim to have had a fairly early connection with telephones. He thought he might claim to be almost one of the very first to have made a telephone in that country. He made as a boy, as quite a young man at least, a telephone from a description that was cabled over here in the '70's, about 1877 it was, when the telephone was first invented, and a very few months after that he had the great pleasure and the great honour of assisting Graham Bell when he gave one of his lectures and demonstrations—those lectures and demonstrations at the time when he was introducing his invention to the British people. He was very proud of being able to look back, of having been, in a very minor capacity it is true, associated with the early work in telephones. But he gathered from what the proposer of the toast, his friend Mr. Gill, had said, that there was a full recognition among telephone engineers of the fact that electrical engineering was one and indivisible, that it was not possible to divide the industry, the science and the practice into watertight compartments.

The actual engineering and technical connection was really a very close one indeed. He thought telephone engineers owed something to the heavier departments of electrical engineering, and he also thought that they on their side owed something to telephones. He always felt that there was too much of a tendency among all sections of electrical engineers to erect barriers between the different branches. ("Hear, hear.") He felt quite sure from what Mr. Gill had said that that was not the case with the engineers of that great company. Might he give one illustration of the sort of mutual help that had taken place? He had for some time been working at problems connected with the improvement of iron for magnetic purposes, a subject on which he happened to have been engaged for some years, and in the last two or three years he had been engaged particularly on the commercial development of the improved iron invented by Sir Robert Hadfield, and he thought he was not divulging any secret when he said that although that iron had been developed for heavy electrical engineering work it did give a very distinct improvement in telephone work, however small the amount might be of metal used. It was not perhaps important in quantity, but he was satisfied from the tests he had made and from the improvements and tests he had heard of that for the first time in the last 30 years there had been produced an iron which, without any change whatever in any telephone, gave distinctly better results under any given conditions. (Cheers.) That is one alteration in telephone engineering. And then Mr. Gill mentioned the great services of Mr. Duddell, not by any means confined to the work mentioned by Mr. Gill. There was another illustration of the connection between different branches of engineering that he would like to refer to. It was a case of which, perhaps, most of them had heard; it was not one connected with telephone work, but with telegraphic and submarine cable work. He had always felt, and probably most of them had felt, that there must be a possibility of great advances being made in the older branches of electrical engineering by men who had been trained in the newer branches, and a very remarkable example of that had within the last few years been developed into great commercial importance, and that was the improvement in the relays used with submarine cables. There was a young man who was a draughtsman in some dynamo works—who applying to telegraphic problems the knowledge he had gained in dynamo rooms, in the designing and working of dynamos, transformers and such things, had been able to solve an engineering problem of very great importance indeed. He had been able for the first time—although many men, including Kelvin, had striven for many years at the question—to solve the very difficult problem of the re-laying of Atlantic cables. When he (Mr. Mordey) told them that one of the companies alone—he thought he was revealing no secret, because the figures had been mentioned publicly—was paying a royalty of £7,000 a year for the use of the invention, they would realise that it was a very important one, and it was one that came entirely from applying to one branch, an older branch, knowledge gained in a comparatively new branch. He mentioned that because he wished to encourage his fellow engineers, especially those younger than he was to look upon their profession as one in which they should take broad views, and they must not think that they could achieve the highest success unless they took broad views, and unless they kept themselves acquainted with the developments in other branches of the profession as well as in that in which they happen to be engaged themselves. (Cheers.) The electrical industry is a great and growing one, and he thought that to-night he would merely give one example to illustrate that kind of thing electrical engineers had to do to-day. In the electrical industry at least one must be industrious.

Mr. W. HOWE said that, conscious as he was of his inability to do justice to the occasion, he knew that in acting as the mouthpiece of the staff in proposing the toast of their Chairman, Mr. Albert Anns, they would weigh his sentiments and not his style. Few words were necessary in support of a proposal which would be accepted with alacrity by every gentleman in that room. It was unnecessary to recount their Chairman's claim to recognition as one of the principal builders of the great fabric of which they were so proud; they knew and acknowledged it. On these occasions they preferred to regard him from the human side: those touches of personal magnetism which have so endeared him to all he has come in contact with and which had gained not merely their admiration but their affection. Notwithstanding his stupendous responsibilities and his deceptively quiet methods, no one had worked harder in the general interest of the staff, more especially in connection with the staff pension fund and otherwise, to deserve their gratitude and praise. He (the speaker) asked them to toast a *Man*—a Business Man—a Gentleman. He knew every one of them would heartily join him in drinking, with a rousing cheer, the toast of "The Chairman."

Mr. ANNS said at that late hour he could not do more than say how much he appreciated the kind expressions used by Mr. Howe and the cordial manner in which the toast was received. Whatever happened in the future he would always remember what good comrades they had been.

This concluded a very enjoyable function.

DEATH OF CHEVALIER R. PORTELLI.

WE regret to record the death of Chevalier ROBERT PORTELLI, who established and owned the telephone service of Malta. He was formerly a superintendent of the Eastern Telegraph Company, and was an old subscriber of the JOURNAL.

THE
National Telephone Journal

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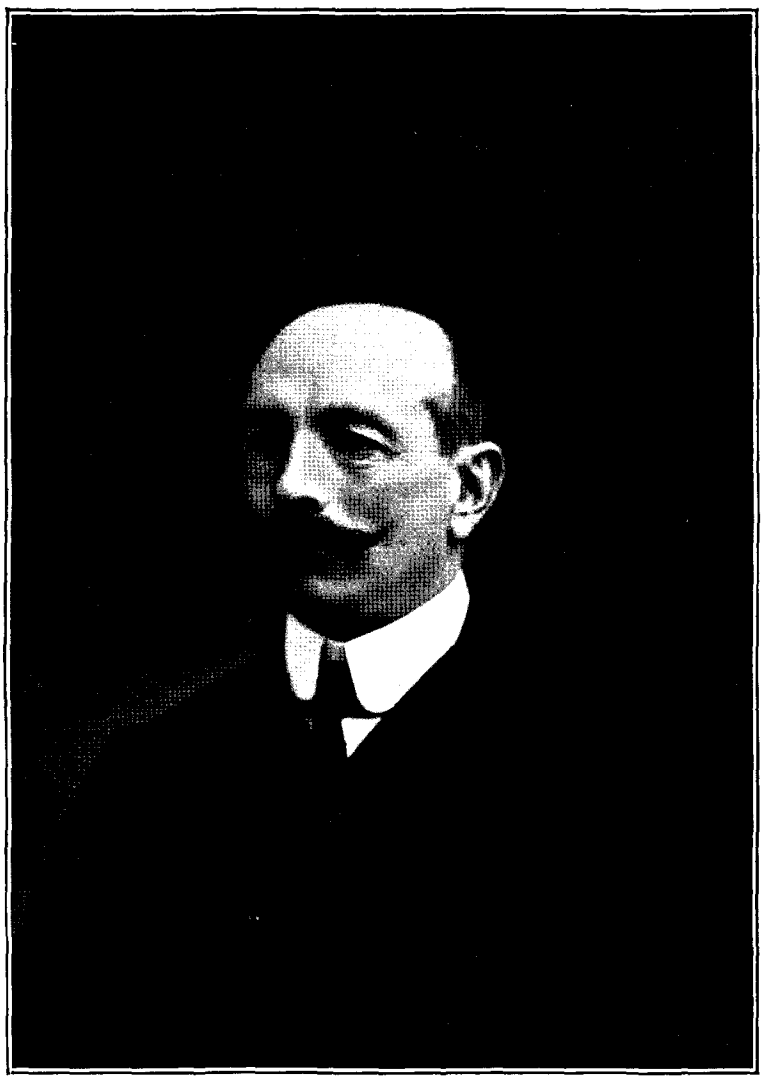
TELEPHONE MEN.

XXXVIII.—EDGAR WILLIAMSON.

EDGAR WILLIAMSON is a Cheshire man, having been born at Kerridge, in that county, in 1864. He was educated first at Macclesfield Modern School, Macclesfield Grammar School, and subsequently at the Moravian School in the Black Forest, Germany. His first acquaintance with the telephone began when he entered the service of the Lancashire and Cheshire Telephone Company as Junior Inspector at Blackburn, in 1881. He was soon promoted to be Chief Inspector, and later to be Local Manager at Blackburn.



The Lancashire and Cheshire Company was, as our readers know, amalgamated with the National Telephone Company in 1889, and under the new *regimé* Mr. Williamson was transferred as Local Manager to Hull in 1890.

The Post Office had an exchange working there, but owing to some difficulty about the license the Company had not commenced operations. Mr. Williamson was responsible for fitting the switchboard with self-restoring drops and bridging indicators, which it is believed were the first of the type brought into use in England. An underground scheme was also carried out, which presented exceptional difficulties in crossing the tidal river (Hull) and various dock basins.

About the same period trunk lines were erected between Hull and Goole and between Grimsby and Thorne for some of them 115 feet high, being lines clear of the shipping on the Ouse and Trent. On the staff re-organisation in 1893, Mr. Williamson was appointed District Manager for the East Yorks district.

Doncaster, iron masts, arranged to carry the

In 1898 he was transferred in a similar position to Nottingham. During his managership there the subscribers' lines were transferred to the Company's new buildings in Nottingham and Derby, where common battery switchboards were installed and metallic circuited underground lines provided. In 1907 Mr. Williamson was appointed to the managership of the Birmingham district.

As a technical specialist Mr. Williamson could have taken a high rank in almost any of the Departments of the Company's work. Circumstances, however, have required him to specialise in management, and he has in a very full measure the combination of qualities which go to make up the successful manager.

Pleasant in manner, fair and impartial in judgment, he is firm in method when occasion requires, and tenacious in purpose when once his opinion is formed.

Like most of his colleagues, Mr. Williamson has always taken an interest in the educational and social efforts of the staff, and has taken an active part in the telephone societies, staff socials, etc. A believer in open air life, he has found his chief recreations in yachting and motoring.

THE TELEPHONE STATIONS OF THE WORLD.

By W. H. GUNSTON.

THE purpose of these articles is to show the telephonic development in stations of the principal countries in the world at the latest available date—where possible at Jan. 1, 1909. The telephone systems of Europe are mostly in the hands of the respective Governments; but in North and South America they are in the hands of private companies, whilst in Asia and Africa they are fairly divided between these two forms of administration. In the case of Government systems and of large companies like the American Bell and the British National Companies, it is generally possible to obtain accurate and reliable figures; but in the case of a country whose telephones are worked by a number of companies of various sizes, some operating in half a kingdom and others in a single town, it is not so easy to get correct and recent information. In all cases the latest reliable figures have been obtained, and where estimates have been resorted to this expedient will be plainly indicated.

Telephone development has been so extremely rapid of late years that it is thought that it will be of interest to make some comparisons of the telephone statistics of the two last decades. These figures show more eloquently than words the ten to twenty-fold increase in stations which have taken place in all civilised countries.

A list, as complete as practicable, showing all the cities of the world containing 10,000 telephones will be appended to the series. The respective figures refer in all cases to Jan. 1 in each given year unless some other date is specified.

EUROPE.

Great Britain.—At Jan. 1, 1909, there were 565,854 stations of which 475,899 belonged to the National Telephone Company, 83,455 to the Post Office, and about 6,500 to the three corporation systems of Hull, Portsmouth and Guernsey (estimating the latter on the basis of their figures of March 30, 1908). In 1889 (see NATIONAL TELEPHONE JOURNAL for May, 1907) there were about 28,000 telephone lines in the United Kingdom, and at the beginning of 1899 120,144. To the latter figure should be added perhaps a thousand or two lines belonging to the Post Office.

The development of the principal towns is as follows:—

	1889 (lines).	1899 (lines).	1909 (stations).
London (Company and Post Office)	6,978	20,561	164,208
Glasgow (Company and Post Office)	2,125	6,927	43,928
Liverpool-Birkenhead ...	1,577	10,413	26,849
Manchester	1,400	5,985	21,209
Birmingham	716	3,559	13,479
Edinburgh-Leith	...	2,772	10,889
Hull (Company and Corporation)	...	1,437	10,800
Leeds	717	3,624	9,072

The London telephone area to which the above figures refer far exceeds the ordinary geographical boundaries of London, and includes Waltham Cross, Barnet, Harrow, Southall, Kingston, Richmond, Epsom, Croydon, Bromley, Dartford, Grays, Romford and Woodford. Within the London County limits there are not less than 154,000 telephone stations, or one to about every 30 inhabitants.

Germany.—The telephone here is in the hands of the Imperial Post Office (which has jurisdiction over Saxony, Baden and the smaller States, as well as over Prussia) and the Bavarian and Wurtemberg Governments. The present number of telephones, Jan. 1, 1909, is 851,319. In 1899 it was 213,032, and in 1889 might be computed at 39,700. Principal towns:—

	1889.	1900.	1909.
Berlin	11,000	42,438	102,965
Hamburg	4,800	16,837	41,809
Munich	...	...	22,160
Frankfurt	...	7,015	19,230
Leipzig	...	6,885	18,556
Dresden	...	7,649	16,623
Cologne	...	6,047	15,686
Charlottenburg	...	...	15,060
Stuttgart	...	...	13,750
Breslau	...	...	12,619
Düsseldorf...	...	...	10,841
Nuremberg	...	...	10,653
Hanover	...	...	9,871

In Greater Berlin, which includes Charlottenburg, Rixdorf, Wilmersdorf, Lichtenberg and Schöneberg and over 3,000,000 inhabitants, there are 139,622 stations.

In 1889 Germany was easily ahead of the rest of the world in the telephonic development of its large cities, numerically at least. At present, although far surpassed by America, it possesses the greatest number of telephones of any State in Europe, and the proportion of telephones to population is about the same as in Great Britain. In the latter country it is about one telephone to every 78 inhabitants, and in Germany one to every 72.

France.—Government system. The total stations now amount to 194,159. In 1899 they were 53,449, and in 1889 9,500. The principal cities are Paris with 65,033 telephones (in 1899 there were 5,300 and in 1904 46,933); Marseilles, 5,572; Lyons, 4,910; and Bordeaux, 3,877.

Netherlands.—The Amsterdam, Rotterdam and Hague telephone services are in the hands of the respective municipalities. The other towns are operated by the Government, by the Netherlands Bell Company and other private companies. At the beginning of 1908 there were 43,449 stations in Holland: ten years ago there were 12,345.

The stations in the principal towns at Jan. 1, 1909 were as follows:—Amsterdam, 10,660; Rotterdam, 8,176; the Hague, 5,810.

Belgium.—The telephone service is in the hands of the State, and at Jan. 1, 1909, comprised 38,503 stations. In 1899 there were 14,247. At the beginning of the current year there were 13,348 telephones in Brussels, 5,496 in Antwerp, 3,685 in Liège, and 2,018 in Ghent.

Sweden.—In Sweden at the beginning of 1908 there were 150,948 stations, of which two-thirds were operated by the State and one-third by the Allmänna and Bell Telephone Companies. The telephonic development of Sweden has always been high. In 1889 there were 13,000 subscribers and in 1899 63,645. In Stockholm with 337,000 inhabitants, the Allmänna and Bell Companies possessed at the beginning of 1909 50,988 telephone stations, and, as in the same city the State system had 17,817 stations at the beginning of 1908, the total stations in Stockholm cannot be less than 70,000. At Jan. 1, 1908, there were 10,547 telephones in Gothenburg and 5,436 in Malmö.

Norway.—There were 49,398 telephones in Norway at the beginning of last year, 14,498 being in Christiania. There are now 15,198 in the capital. Ten years ago there were about 26,000 stations in Norway, and in 1889 about 3,930.

Denmark.—Denmark contained 60,825 telephones at the beginning of last year. In 1899 there were 21,825. At Jan. 1, 1909, there were 37,723 stations in Copenhagen and the suburbs. Copenhagen is operated by the Kjöbenhavns Telefon Aktieselskab, which in the whole of Seeland has 47,553 stations; in 1886 it possessed 1,172 subscribers; in 1896 6,469 stations, and in 1901 18,929 stations. Funen is worked by the Funen Communal Company, and Jutland by the Jutland and South Jutland Companies. In both Aarhus and Aalborg there are about 3,000 telephones.

(To be continued.)

H. DAVIS. L. HARVEY LOWE. J. STIRLING.

G. F. GREENHAM. J. M. SHACKLETON. C. B. CLAY. J. F. EDMONDS. W. F. TAYLOR.

LONDON AND ITS ORGANISATION.

BY J. STIRLING, *Chief Accountant, London.*

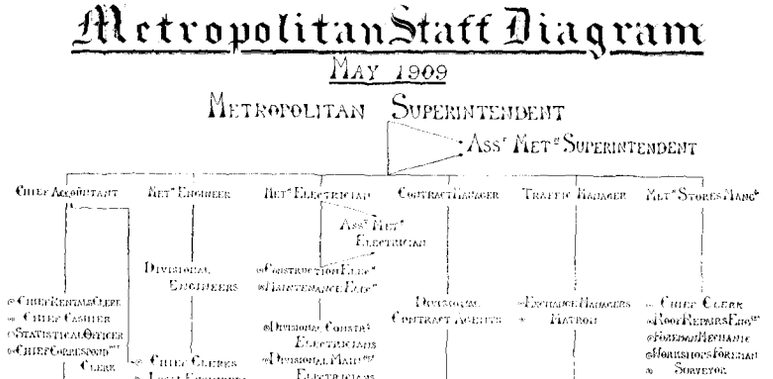
THE telephoning of London grows more complex, and its problems more fascinating, year by year. Telephone men everywhere tell you that they know of no industry or profession to equal theirs in interest and freshness. Intensify those qualities tenfold and the result will give some impression of the difference between the telephone questions to be considered and decided in London and those dealt with in other towns and cities throughout the country.

The indefinable charm and attractiveness of London have often been commented on. Part of this siren's spell surely lies in the hidden possibilities, and no less the hidden realities, of which London is capable. Under busy streets lie many of the arteries of its physical and social business life. In these days the telephone cable has become almost as important to the well-being of the city as its sewage and electric light, its trams and its tubes. So the telephone worker, if he possesses the imaginative gift, can summon up a picture of the busy exchanges, the thousands of wires above and below, the numberless human, mechanical and electrical activities which go to the telephoning of a great city; can feel that he, through his knowledge and experience and labour, has a part in the contriving and perfecting of those hidden entities which, to the ordinary man and the ordinary mind, are unseen and unknown.

A few facts, therefore, not sufficient to bore the reader—some figures, not enough to be wearisome—and one or two observations of a more or less disconnected character, bearing upon what we do in London, and how we do it, may not be without attraction and even usefulness.

The photograph at the top shows the men who hold the reins; the team they control numbers over 4,200. The Metropolitan area is the most complete example in this country of what our American friends call "functional organisation." All the chief officers are located in one building in the business centre of the City; easily accessible to the public and in constant touch with each other and their divisional staff through the medium of a well-equipped private branch exchange. The staff diagram on next page shows in an abridged form how the duties are allocated.

Roughly, a telephone administration may be divided into three branches—plant, traffic and commercial. Within the confines of a magazine article it is not possible to deal adequately with even one. The range of my observations will therefore be restricted to some phases of the commercial side of our work, and will as much as possible keep free of reference to routine methods which apply in all the Company's offices, and are not therefore exceptional to London. In the Metropolitan system, the Chief Accountant's Department combines the functions of treasury, exchequer, information bureau and conciliation board. Into its coffers pass some £940,000 per annum. It deals with all expenditure estimates; supplies particulars of contracts, wayleaves, staff, works orders; files and types all correspondence; settles claims from subscribers, and holds a general supervising brief from the Metropolitan Superintendent. Having to "pay the piper" it naturally enjoys the privilege of "calling the tune," and so can bear testimony to the excellence of the music. Indeed, the freedom from jars and discords is somewhat remarkable in so large and varied an orchestra.



Here are some striking figures, which show the volume of business transacted:—

Number of telephone stations	115,000	
Number of accounts and notices for rentals and local fees	21,250	per month
Local fee tickets...	1,500,000	,,
Post Office fee accounts	19,600	,,
Number of accounts and notices for sales and removals...	2,700	,,
Receipts issued for remittances ...	282,300	per annum
Petty cash vouchers	6,250	per month
New wayleave agreements	4,500	per annum
Petty cash payments	21,300	,,
Number of fee journals	83	
Debit and credit notes from other districts (excluding stores) ...	315	per month

It would be difficult, unless one were a born idler, to find work tedious when dealing with interests so varied and immense.

The largest of the four main branches of the Accounting Department is the rentals office. Through it pass all the troubles which suddenly arise when accounts are rendered, and for dealing with which a special staff of correspondence clerks is required. All letters concerning accounts go to one of four correspondence divisions: (*a*) rentals of subscribers A to G; (*b*) rentals of subscribers H to Z; (*c*) trunk and local fees; (*d*) removals and sales. The work requires tact, courtesy, firmness, a capacity for sifting wheat from chaff and some knowledge of human nature. Considerations of general policy and wayleave complications have frequently to be the deciding factor, and are difficult elements to appraise when constantly dealing with large companies and corporations, or with individuals occupying a high standing in the business, political or social world. Generally speaking, our difficulties are in inverse ratio to the size of the account; it may be because necessity compels the small user to keep a stricter watch on every item of expenditure than his more prosperous rival.

From time to time an agitation arises as to the accuracy of our exchange recording. Quite recently we kept a special record of letters received from message rate subscribers on the subject of their accounts, and the low percentage on the total number of accounts dealt with per month was most gratifying; one may also whisper that a fair proportion were of the "inveterate" type. There certainly does not seem to be that general dissatisfaction with the Company's records of which we so often hear. A recent case in which a caretaker admitted that he had sent several calls during the month ended in a subscriber's apologising for the letters he had written. Another was that of the servant girl who learned, after making a trunk call, that a fee would be charged, and sent the amount to the office with a request that her mistress should not be informed. These are two instances, jotted down from recollection; they could be multiplied a hundredfold. Unfortunately the caretaker cannot always be brought to book, nor does the servant always pay up.

After the publication of each directory we have a short period of storm. Not that the mistakes are many. In January, 1909, the

FEE TICKETS.

errors were ·24 per cent. of the total entries, and some of these were due to incorrect particulars furnished by the subscribers themselves. As from the subscriber's point of view an error or omission may be somewhat serious, very special pains are taken in the compiling of the book and the proof checking. Five clerks are constantly on the work throughout the year, and this staff is increased to nine when the proofs come in. Even a telephone directory has its curiosities. The Archbishop of Canterbury told an audience that he once got a letter addressed "Canterbury, London." On the envelope a Post Office official had marked "Not music hall—try Archbishop." A London evening paper suggested that His Grace might find the explanation in the telephone directory entries:—

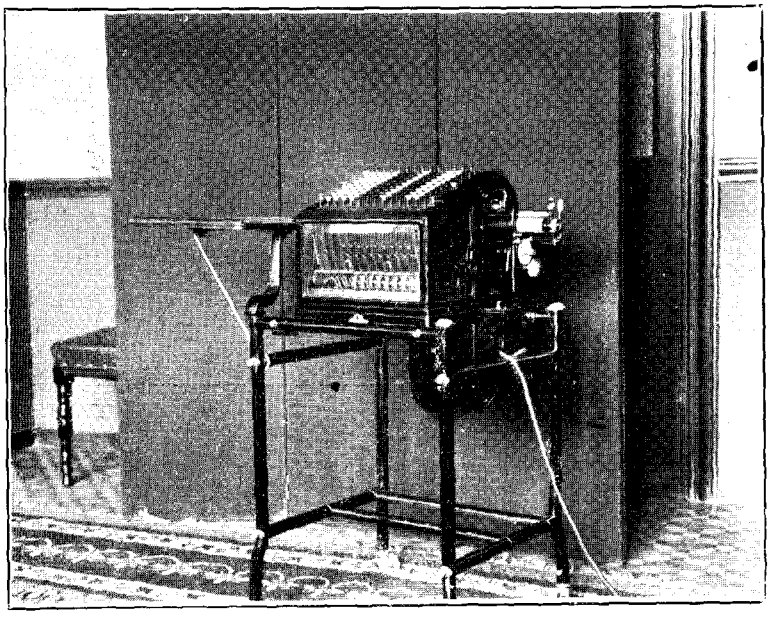
"Canterbury, Archbishop of."
"Do. Theatre of Varieties."

The number of forms containing subscribers' particulars for the directory dealt with during the past year was 19,250, while letters on directory questions totalled 7,650 for the same period.

The calls for 62 per cent. of our message rate subscribers are recorded on registers, the remaining 38 per cent. on tickets. The sorting of local fee tickets is no light task, and is carried out by a staff of fourteen clerks. The charging up of the tickets according to the class of service is, of course, done from

analysis sheets, on which they are entered after the sorters have finished. Post Office tickets for trunk calls and telegrams number 104,500 per month, and 3,300 separate charges for Post Office facilities are, in addition, dealt with from postmasters' statements. All register readings are read out by telephone at the end of each month. Ten clerks are employed simultaneously on entering the figures in the journals. Rarely does a mistake happen, and considering the rapidity with which the work is done, the results are very creditable. Up to a few months ago the readings were mostly taken after office hours; this was objectionable for more than one reason, and was stopped. No overtime is now required. Practically all fee work is done by lady clerks, 58 of them, including sorters, being employed.

The adding machine combines novelty with utility. It consists of sets of keys, similar to those of a typewriter. Each key represents a figure, and, according to its position, denotes pounds, shillings or pence. The pressing of the keys causes the corresponding typed figures to be recorded on a sheet of paper inserted in the machine. By an ingenious mechanical device the pressing of a special key results in the total of all the figures on the sheet being instantaneously recorded. Until quite recently London was the only office of the Company using one, as only in very large offices can it be made to pay. All our fee balances are got out on it,



ADDING MACHINE.

with a consequent appreciable saving in time and less liability to error. As Head Office accept these totals as correct, the use of special balance books for fees has been dispensed with.

Were it not that telephone staff are too diligent and fond of their work, one might tell of sighs of relief and glances at the clock when the sound of trolley wheels is heard in the corridors of Salisbury House. Four trolleys are used to convey the 112 registers in which are recorded the particulars of subscribers' rentals to the strong room in the basement. They are taken down in the lift, and the operation requires some delicate and careful manœuvring. Indeed, not long ago a considerable sensation was caused by the attendant falling down the lift well while manipulating one of the trolleys. Fortunately his injuries were not serious.

The entering and posting to the registers is done by nine clerks, each of whom is responsible for the entries of all subscribers whose surnames begin with letters in a specified section of the alphabet. This arrangement is simple, works smoothly and permits of easy reference. Separate books are not kept for different classes of subscribers.

The cashiers' main office is railed off into two divisions—paying and receiving. For obvious reasons, the former is the more popular with the staff, the latter with the Company. The subscriber sits on the fence and looks askance at both; this attitude is getting less pronounced, as the service in London is now so good that most telephone users pay for it with greater goodwill. The receiving counter on a busy day—immediately after the month's accounts have gone out—is a scene of bustle and continuous activity. Throughout the hours before lunch the flood of callers is incessant, and immediately a slight lull occurs an immense volume of postal work has to be tackled.

(To be concluded.)

ENERGISE!

BY J. H. CORLETT, *Contract Officer, Leeds.*

"How's business?" This has been the good-natured, cheery enquiry between commercial men, just as it was when the oldest among us left school and proudly took up our first employment.

What impressions can each of us unearth of those days and months! Our eyes and ears opened wide to see and hear how the masters of commerce used tact and diplomacy in various ways to suit their customers.

What excitement we felt when first one of these customers with kindly interest asked us "How's business?" How we determined to be capable of giving a favourable answer next time the question might be put to us. I believe we would have scorned our own master if he had replied with the despairing word "Rotten," which is so often the reply to-day. In our teens we realised that each reply to the question would exemplify the individual energy of the person making the reply. This is just as clearly the case to-day! Has individual energy so declined, that shame no longer attaches to a man who thus admits defeat.

Master tradesmen use this shameless reply to-day—especially those who have not even tried the advantage of the telephone in their business. They blame the Boer War, they blame the Government, they blame competitors, especially foreign ones, they blame the weather, and would even ask protection from it, if every other difficulty were removed; but they never turn their eyes inward, although every futile complaint they make only proves conclusively their own want of energy. The increasing magnitude of the murmuring of these masters is the prime cause of much commercial cowardice.

How shall we all regain the vigour, spirit and resolution of our fathers, who never acknowledged defeat and made England foremost among the nations in commercial enterprise and reputation? I have heard these master tradesmen reply, "By increasing the demand for our manufactures," "by taxing foreign imports," "by killing competition," "by making labour unions unlawful." In other words—by making things easy for them according to their different circumstances! Is easiness, then, the high road to energy? If one could do all these men ask, they would not find pluck to expend £6 for a whole year's advantages of the telephone; and yet they expect all the benefits of enterprise and speculation, while they sit on whatever they have saved or their fathers have bequeathed to them.

The larger your capital the greater is the demand for your personal energy, in order to render a fair return to your country and to yourself. How many seem to invert this principle to-day! England still expects the capitalist and tradesman to do his duty, as well as the strong healthy workman. We rightly point the finger of scorn at the labourer who won't labour because he cannot find an easy and congenial task. Where lies the difference between your complaint and his? If you will do your whole duty the unemployed question will vanish quickly. Let the income tax assessors say, "If you don't make so much, you ought to do, and you must pay income tax on that amount."

Energise yourselves, my masters! By so doing you can stir up the business of England, find fresh markets as your fathers did, and don't cry "Stinking fish" or reply "Rotten" to the question "How's trade?"

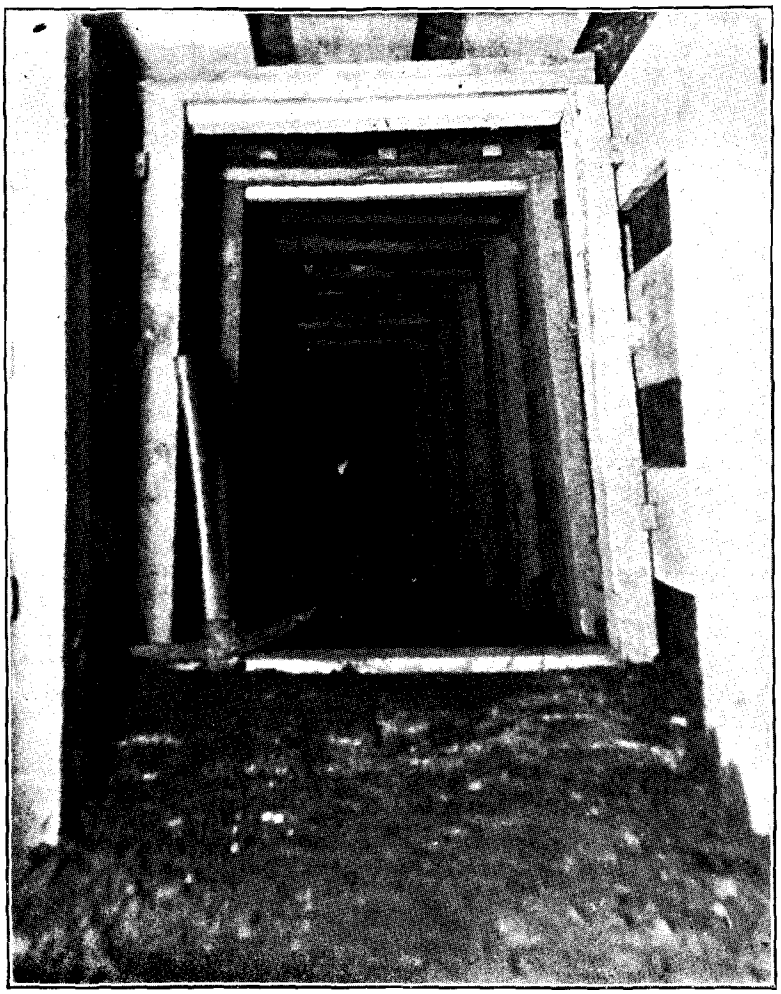
NOTES ON SOME UNDERGROUND WORK IN LIVERPOOL.

By ERIC P. G. SHEPHERD, *Assistant Engineer, Liverpool.*

THE following notes may prove of interest, as the work in question presented some special features:—

For some time past it has been apparent that another exchange in the centre of Liverpool is needed to relieve congestion in the "Central Exchange" and provide for future development.

After due study and consideration, a site was bought and a building erected in South John Street, the nearest available point to the theoretical centre. The site chosen was such as to make it possible to intercept existing cable routes at very advantageous points and divert them into the new exchange.

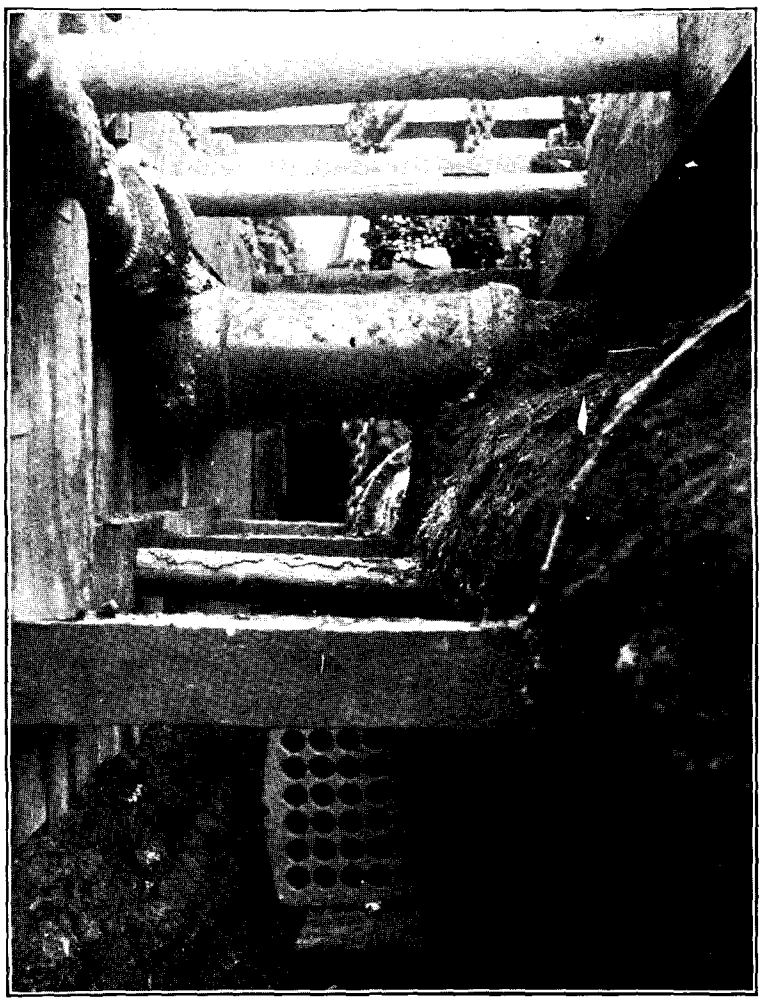


HEADING UNDER LORD STREET.

In order to do this it was decided to lay 36-way blocks for an approximate distance of 280 yards from an existing manhole at the corner of Victoria Street to the new exchange manhole.

Although this distance was short, the difficulties to be overcome were considerable, owing to the fact that the subsoil in that part of Liverpool is crowded with sewers, gas, water and hydraulic mains, electric light cables, Post Office pneumatic tubes, etc. In addition to these difficulties, the blocks had to be carried under one of the main tramway routes where traffic could not possibly be stopped at any time, and this necessitated driving a heading of about 32 feet in length under the road bed.

One troublesome feature was that a 24-inch gas main crossed the line of trench at a slight inclination, but this was overcome by a deep excavation.



TRENCH SHOWING 24-INCH GAS MAIN.

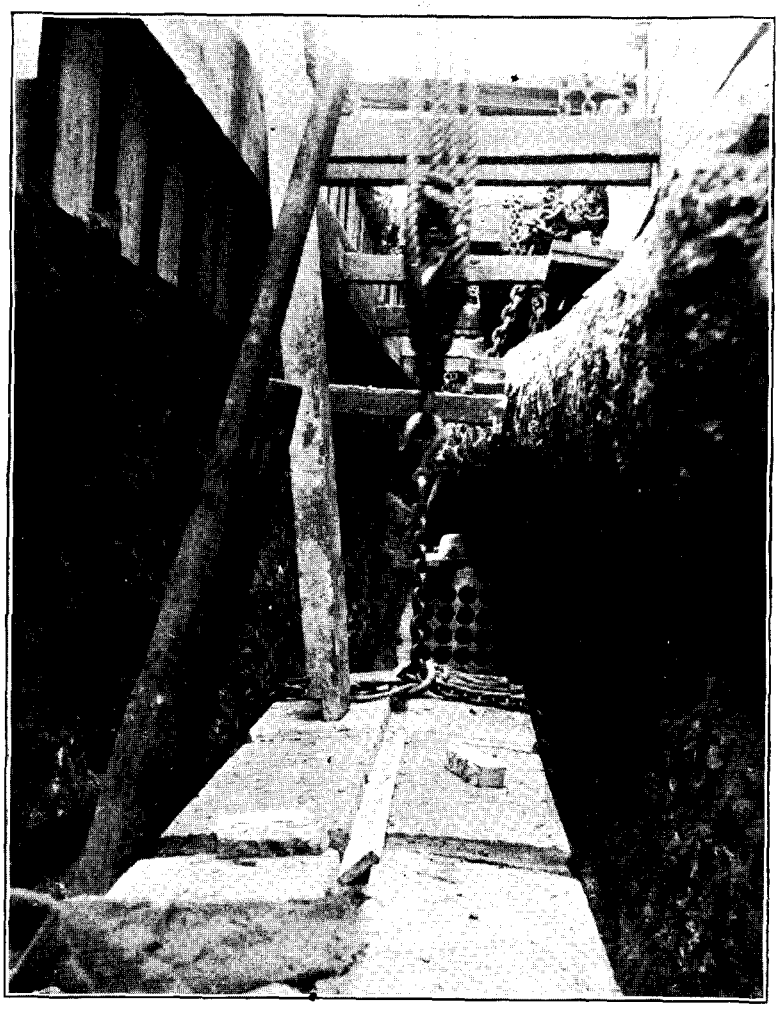
The accompanying photographs show sections of the trench at various points and give a view of the heading under Lord Street.

The work was carried out by Messrs. J. Aird & Sons, Limited.

W. E. L. GAINE MEMORIAL FUND.

READERS will remember that in the March, 1908, number of the JOURNAL appeared a paragraph stating that this fund (which amounted in all to £240) would be applied to enabling members of the staff in straitened circumstances to pay visits of about a fortnight to convalescent homes when necessary to recuperate their health. It is thought that the following table, showing the expenditure under the fund up to date, may be of interest; the payments vary considerably in amount, principally because in some cases more advantageous terms can be arranged with convalescent homes than in others, and partly because in cases such as consumption a fortnight's rest would have been of little use, and a longer term was therefore arranged for:—

	£	s.	d.
Clerk. Appendicitis	1	17	0
Pot-boy. Influenza	0	16	0
Wireman. Bright's disease	0	17	0
Operator. Enteric	1	19	0
Caretaker. Neuritis and rheumatics	1	4	0
Operator. Influenza and anæmia	0	17	0
Clerk and collector. Threatened consumption ...	6	0	0
Operator. Hæmorrhage	1	15	0
Foreman. Fractured skull	0	12	6
Operator. Cancer	6	6	0
Collector. Influenza and congestion of kidneys ..	0	19	6
Foreman. Tuberculosis	6	10	0



TRENCH SHOWING ANOTHER VIEW OF 24-INCH GAS MAIN.

	£	s	d.
Foreman. Bronchitis, etc.	1	15	0
Plater. Anæmia	0	13	3
Packer. Debility	0	18	0
Clerk. Catarrh of chest	6	0	0
Operator. Internal complaint	5	0	0
Messenger. Pneumonia	1	0	0
Caretaker-operator. Dysmenorrhea	2	13	0
Wireman. Threatened consumption	6	0	0
Operator. To recuperate...	2	17	0
Labourer. Consumption	8	0	0
Packer. Tonsilitis and debility	0	18	0
Wireman. Shock and injury	3	14	6
Operator. Appendicitis	2	1	0
Former local manager. Bright's disease	2	10	0
Monitor. Internal complaint	4	4	0
	£77	16	0

TIME'S WHIRLIGIG.

AN interesting fact transpires (writes a correspondent) concerning the thoroughfare in which the Company has acquired premises, which in due course will become the Leeds "City" Exchange. The thoroughfare is now known as Basinghall Street, but its old name was Butts Lane, as down it the archers travelled to the Park Butts. It must certainly be in accord with the fitness of things that the place which in the tenth and subsequent centuries was associated with the bow and arrow, a medium in the hands of skilled operators for getting quickly and truly to the mark, finding "billets" for many, providing a means of communication, promoting trade and the public interest, and the safeguarding of the person, should in the twentieth century become associated with the telephone, a medium enforcing in the truest, widest, largest sense possible the axioms "Distance no object," "Time means money," "Knowledge is power," "Communication, the royal road to success," and "Trade follows the 'phone." Thus doth history repeat and progress assert itself.

THE FIRE ALARM SYSTEM AT BATH.

BY W. C. OWEN.

THE provision of some efficient and expeditious method of calling for the services of the fire brigade or police is a form of insurance in the interests of the public at large, the value and importance of which it is hardly possible to over-rate; yet it is a surprising fact that there are to-day still many comparatively large cities and towns throughout the kingdom unprovided with any efficient system of this nature whatever, and probably they will continue as they are for ever unless some catastrophe occurs as a direct result of their neglect to avail themselves of means of preventing such an occurrence, or some enterprising contract

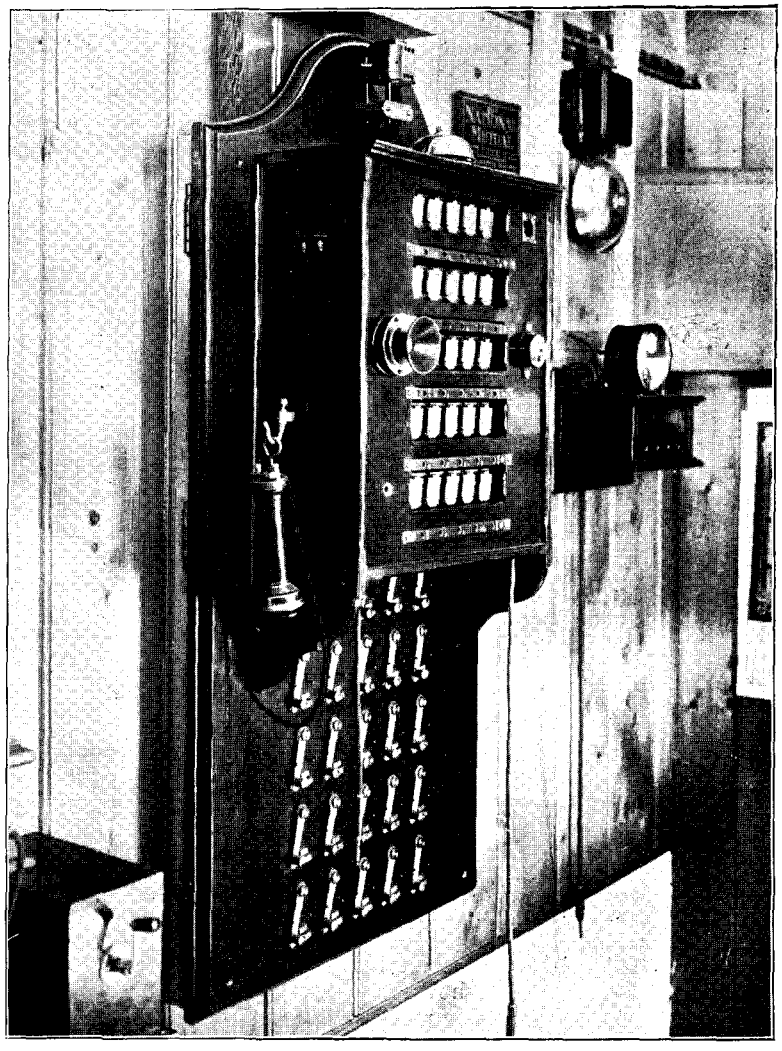


FIG. 1.

manager manages to convince the powers that be in such places of the error of their ways, and prevails upon them to realise in a practical maner their responsibilities in this matter. When the governing body of a city or borough has at least been brought to this desirable state of feeling a great amount of controversy usually follows with regard to the best system to adopt out of the many placed before them, each and all of which, according to the statements of the respective owners, possess points of superiority over all other systems ever invented. Now, without question, nowadays the National Telephone Company can undoubtedly provide a fire alarm system either on a large or small scale at a reasonable price, having points of advantage of the greatest value which cannot be offered by any other administration, public company or private contractor. The most important advantage which the Company can offer is that it is now generally practicable for them to connect

up fire alarms by means of wires laid underground, thus reducing to a minimum the chance of a breakdown owing to bad weather conditions or the hundred and one other causes of trouble inseparable from the use of a system served by open overhead wires. Another very important advantage the Company can offer is that they always have an efficient technical staff on the spot ready to rectify with the least possible delay any defects which may arise, thus saving valuable time and the expense which would be involved if it were necessary to obtain the services of expert men from a distance. Having, some little time ago, completed the work of providing a most efficient fire alarm system, containing several novel features, to the order of the Bath Corporation, a short description of the same may prove of interest to the readers of the JOURNAL, and may possibly be helpful to contract managers in obtaining orders for similar installations, for we have such confidence in the merits of the installation that the latter gentlemen need have no hesitation in recommending the adoption of what we may, I think, rightly term the Bath system. This system has been evolved, by certain members of the local staff here who have taken a very keen interest in the matter, out of the Company's standard buzzer system which the fire brigade committee condemned as not suited to their requirements in many respects. The installation consists of a switchboard of special design at the

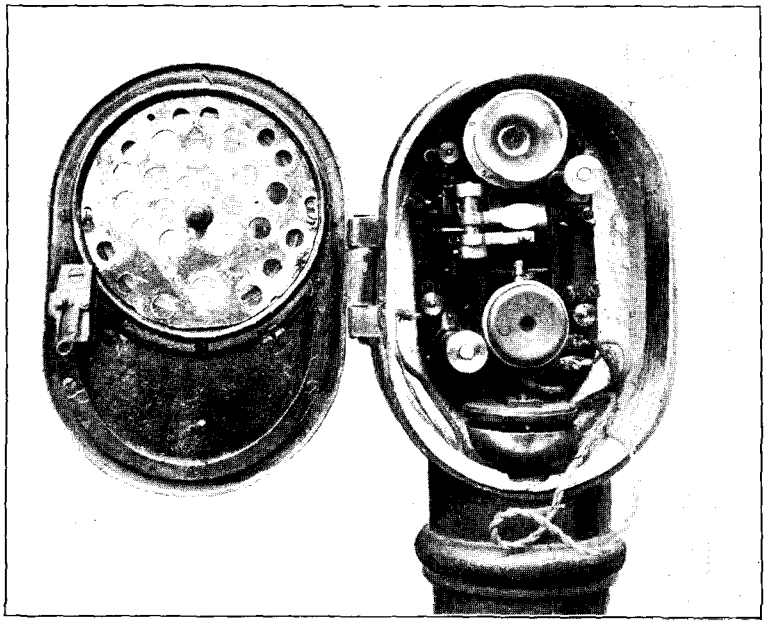


FIG. 2.

fire station to which are at present connected by underground metallic circuits taken direct to fire station fourteen sets of street fire alarm apparatus fitted in pillar boxes of the Company's ordinary standard type, a separate circuit being provided for each alarm on the system. In Fig. 1 is shown a general view of the switchboard. At the top is a loud-speaking receiver and immediately beneath this is fitted an alarm bell. Then in alternate rows of five in a row are fitted fire-alarm indicators of the Company's standard pattern and five-point spring jacks. To the left of the indicators and jacks is fixed the speaking apparatus, consisting of fixed transmitter and a receiver which hangs on a switchhook. To the right of the indicators and jacks is fitted a star indicator with an eyeball indicator above it, the uses of which will be explained later on. Two plugs and cords are provided, one in connection with the switchboard speaking set and the other connected to and terminating an extension circuit to the police station, this latter plug being only for use when a call is made for the police, and it can only be inserted in a special jack provided for it beneath the transmitter. On the lower part of the switchboard are rows of special two-way switches corresponding with the indicators and jacks above. The street pillar apparatus (Fig. 2) consists of transmitter, loud-speaking receiver of the Collier-Marr type and an ordinary receiver, these latter being joined up in series. At the bottom of the base board on which the whole apparatus is fixed is a 100-ohm circular bell. An induction coil and a metal frame carrying two spring lever switches, one of these being actuated on breaking the glass in the door of the box when the fire call is given and the other when the door is open and a police or any other than a fire call is being made. Figs. 3 and 4 are diagrams of the connections of the street pillar apparatus and switchboard respectively, but before describing the method of operating and the use of the various parts of the apparatus I would explain that the calling is effected over earth circuits, but the speaking is by metallic circuit, and in this respect it differs

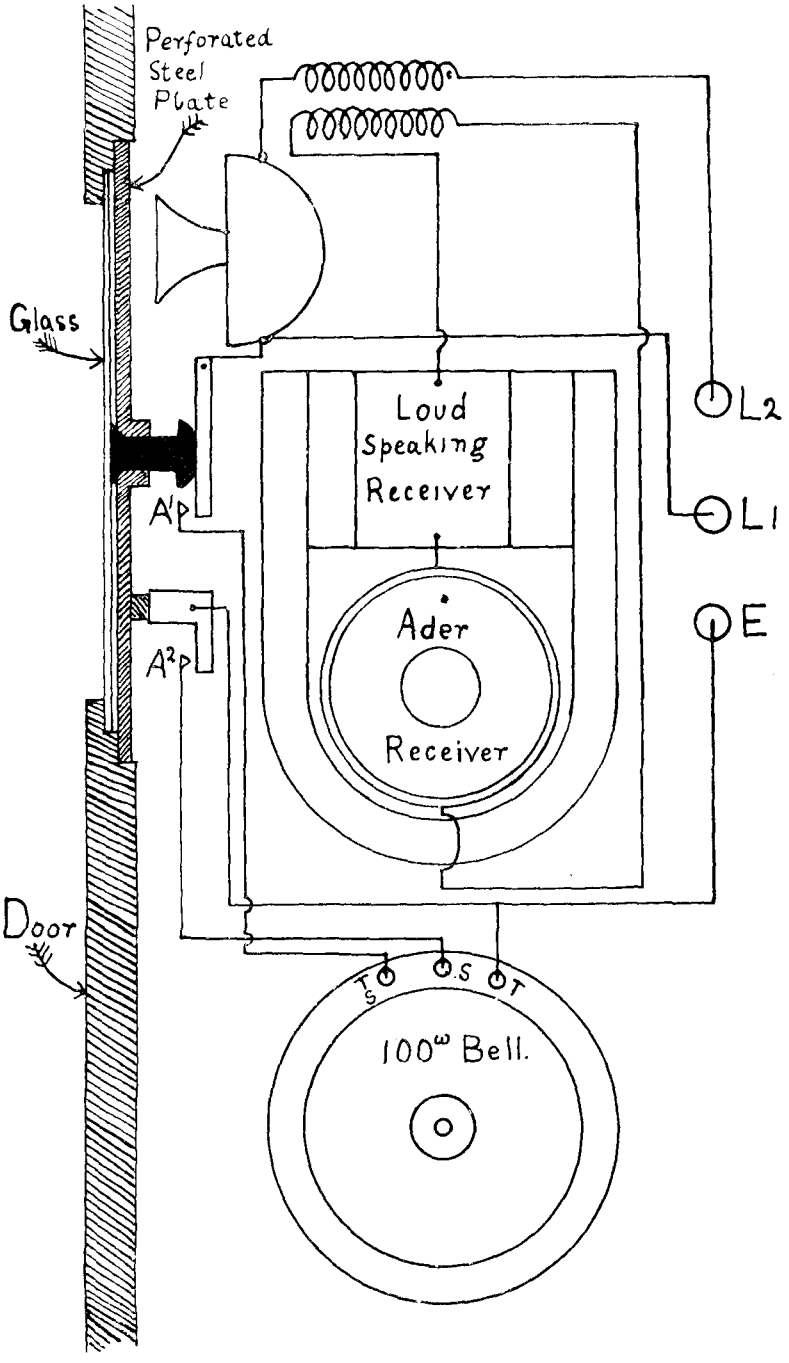


FIG. 3.

completely from the Company's ordinary buzzer system. On a fire call being made from a street pillar, which is done by breaking the glass, the 100-ohm bell, which is earthed, is connected to the line by a spring lever switch (A 1, Fig. 3), and a current flows from earthed calling battery (B 1, Fig. 4) at fire station through a 125-ohm relay (R 1, Fig. 4) indicator, switch and five-point jack on the switchboard (the switch being turned to the left-hand side, its normal position) over line L 1 through the 100-ohm bell at the pillar to earth, thus completing the circuit. The current taken by

the bell is, of course, an intermittent one, and consequently the relay R 1 at the fire station vibrates synchronously with the vibrations of the bell armature. This relay joins up a local circuit through part of battery B 3, in which is inserted the loud-speaking receiver fitted at the top of the board and an induction coil; the chattering of the relay sets up a very loud and very distinctive rattling noise in the receiver which can be heard all over the fire station. This noise can only be produced when glass has been broken at the pillar, thus indicating a fire as distinguished from a police or any other call. No fault of any ordinary kind can cause this distinctive call to be made; which is a very strong point in favour of this system. On the indicator shutter falling, due to the flow of this current, the alarm bell is rung, this being joined in local circuit through contacts on the switch-hook, the current being drawn from battery B 2. On getting the call the fireman on duty at the station takes the receiver off the switchhook, cutting off the bell, but not the loud-speaking receiver, which, if it is a fire call will continue rattling until he inserts the plug (1 in Fig. 4) into the jack, immediately beneath the indicator the shutter of which has fallen. As will be seen the insertion of this plug cuts off the calling battery, relay R 1, indicator and switch, and substitutes for this calling battery one of 14,666 cells having no earth

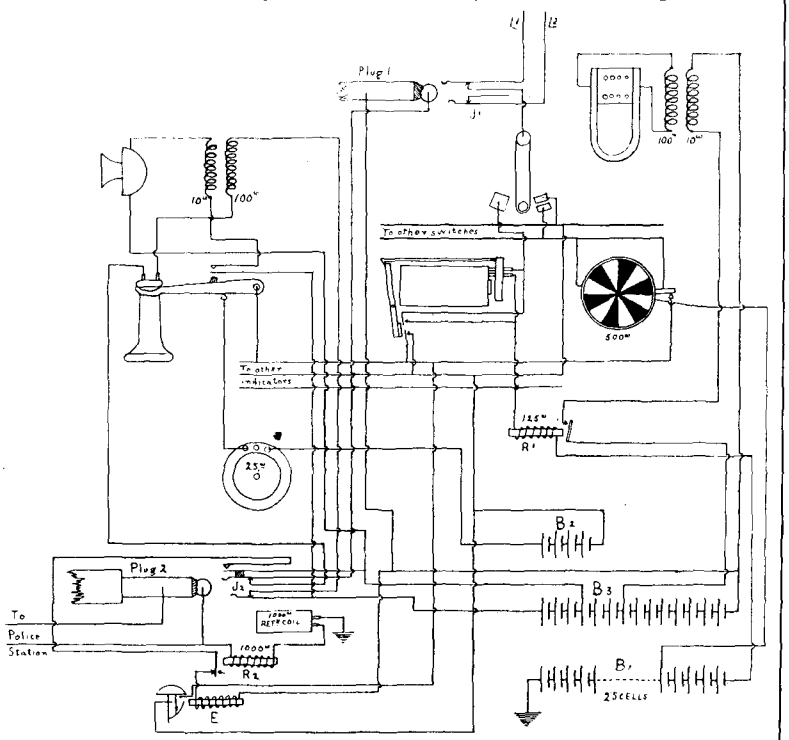


FIG. 4.

connection on it whatever. As a consequence of there being no earth on this battery it will be readily seen that the 100-ohm bell at the pillar will no longer continue to ring. This battery, B 3, supplies current over the metallic circuit to the primary of induction coil and the transmitter at the street pillar; the secondary circuit of the coil with loud-speaking and ordinary receivers in it, being a purely local one. The insertion of the plug by the fireman enables him to speak to the person giving the alarm at the pillar box who can also speak to him through the broken glass and perforated steel guard plate. The speaking is exceedingly clear, and the fireman can readily carry on a conversation with anyone standing near the box. The latter, of course, hears the fireman principally through the medium of the loud-speaking receiver, for the apparatus is not accessible to him unless he has a key with which to open the door. In addition to the bell in the pillar box serving the purpose of actuating the loud-speaking receiver at the fire station, it also has the advantage of attracting the attention of a policeman or any other passer by to the fact that someone has broken the glass, and if this has been done maliciously the culprit can generally be at once detected—practically in the act. As far as the use of the apparatus to give another alarm is concerned, it is now out of action until new glass has been fitted. Until this is done the fireman at the station turns a two-way switch corresponding with the circuit on which the alarm has been received to the right-hand position, and withdraws the plug from the spring jack. This cuts out the indicator and main calling battery B 1 and joins up in their place a few cells only of this battery and a 500-ohm star indicator which shows white, its colour in the normal position being black. The star when thus actuated continues to show white until the glass is replaced and the door properly closed in the pillar box. It then at once shows black again and rings the alarm bell, thus proving the circuit to be in order again and notifying the fireman in charge that this is so, when he immediately turns the switch lever to the left-hand side, its normal position, cutting off the bell and leaves the circuit ready for any further call to be made. I may mention that although the box is out of action while the glass is broken, so far as giving an ordinary alarm is concerned, the apparatus can nevertheless be used by the fireman on the spot to communicate with the station, as, by pressing the plunger which projects through the steel

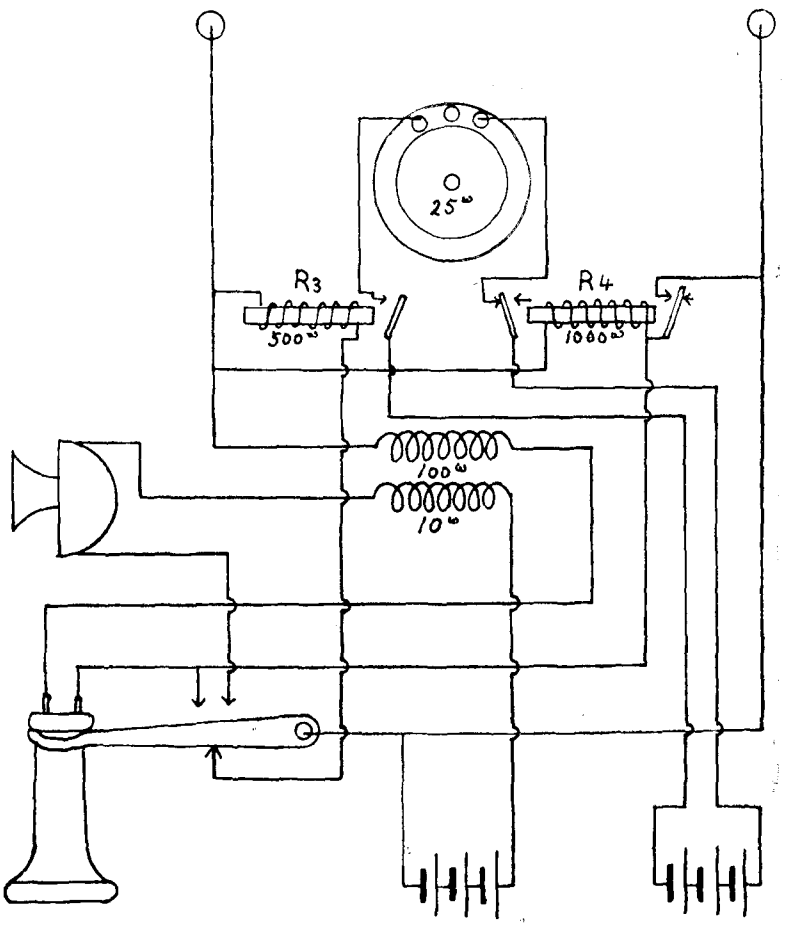


FIG. 5.

plate and is normally held back by the glass, he can call the station by actuating the star indicator. This as briefly as possible explains the method of using the apparatus and the way it is connected up, so far as its use purely for fire alarm purposes is concerned, but it also has the great advantage that it can be used by the police as well for ambulance or any other purpose. In the case of a policeman using the apparatus, it is requisite that he should carry a key which will open any of the pillar-box doors. Upon opening the door both the spring lever switches are actuated simultaneously, the lower one short-circuiting the trembling contacts of the 100-ohm bell in the pillar, and the call is received at the fire station in exactly the same way as in the case of a fire call, with the important exception that the loud-speaking receiver on the switchboard remains silent. The fireman on duty is thus aware that the call is not due to the glass being broken but to the door being opened by a policeman or some other duly authorised person, who is enabled to use the apparatus in the same way as in the case of an ordinary telephone set. The police station not being in the same block of buildings as the fire station, it became necessary, in order that the police might

make the fullest possible use of the system, to devise some means by which any circuit could be immediately switched through to the police station direct, while at the same time leaving its control in the hands of the fireman in charge at the fire station. The method adopted of overcoming the difficulties which presented themselves in providing this extension to the police station, possesses some novel features, and it has given every satisfaction since its installation. Fig. 5 shows the connections of the apparatus at the police station, consisting of transmitter, induction coil and receiver hung on an ordinary switchhook, for which purpose a Decket party line instrument is actually converted, the magneto bell being replaced by circular trembling bell and two relays R 3 and R 4 (Fig. 5), used for signalling purposes. An ordinary metallic circuit is run to the fire station, where it terminates on the plug marked No. 2 on fire alarm switchboard (Fig. 4). The tip of this plug is also connected, as will be seen on reference to diagram, through 1,000-ohm relay R 2 and a 1,000-ohm retard coil to earth. An eyeball clearing signal is fitted on the switchboard, and a special spring jack J 2 (Fig. 4) as already mentioned. Upon the receipt of a call for the police station the fireman who answers the call simply inserts plug 2 in spring jack J 2, hangs the receiver on the rest, but does not withdraw plug 1 from the spring jack of the calling circuit. He does nothing further until the eyeball signal is actuated, ringing alarm bell, which is his clearing signal, when he at once withdraws both plugs from the spring jacks. What happens when the fireman at the station has made the connections as just described is as follows:—Current from the main speaking battery flows through the 500-ohm relay R 3 (Fig. 5) at the police station and, of course, also over the main circuit and through the transmitter and coil at pillar box, the whole of the speaking apparatus at fire station being cut out of the circuit. Relay R 3 being actuated by this current closes local circuit through the trembling bell and normal contact of relay R 4. This bell calls the officer on duty and will continue to ring until receiver is taken off rest. The removal of the receiver from switchhook actuates the 1,000-ohm relay R 4, which is thereafter retained until plug 2 at fire station is withdrawn, while at the same time relay R 3 is disconnected by the circuit being broken at the switchhook contacts. It must be explained that the special object of relay R 4 is to prevent the bell from continually ringing if the receiver is temporarily replaced on the hook. It is, of course, unnecessary to describe the local circuit at the police station, as it is only of an ordinary character. When conversation is ended between the policeman at the pillar box and the officer at the police station, the door of the pillar box is closed, cutting the earth off the circuit at the pillar box, thus releasing the tongue of a 1,000-ohm relay, R 2 (Fig. 4), which tongue completes local circuit through eyeball signal and gives the clearing signal to the fireman at the fire station as already mentioned.

Although not at present fitted to the apparatus here, a very simple arrangement can be provided, if thought necessary, for testing the continuity of the various alarm circuits, all that is required being the addition of a push connected to the spare inside spring of the line jacks (one push being of course provided for each circuit) for the purpose of earthing the line. Briefly summarised and shorn of the technical details given above the advantages of this system are as follows:—

Each alarm is connected to the fire station by a separate underground, so that a fault on any circuit can effect that one only.

A fire call cannot be given owing to any fault in the line circuit, but only by the glass in the door of the pillar box being broken; this is a very strong point, for in most other systems a false fire call always results, if a line circuit becomes earthed, short-circuited or faulty from any other cause.

Between pillar boxes and fire station thoroughly efficient telephonic communication is established, which can be used immediately either for fire or police purposes. These alarms have been tested experimentally many hundreds of times since they were first installed, and they have been brought into practical operation on many occasions, and in no single instance have they failed in any way. We have thus good grounds for our faith in the system as being a thoroughly efficient one in every respect, and one which can be put into operation by anyone.

TELEPHONE WOMEN.

XLIII.—ELIZA ADAMS.

"FORWARD" is the motto inscribed on the Birmingham city arms, and here as elsewhere the telephone has been an important factor in helping to realise that aspiration.

By those who have read the notices of telephone women which have already appeared in the JOURNAL it will be observable that the story of the development of the telephone service in all parts of the kingdom is largely concurrent with the history of the progress of the Company's operating staff. When Miss Adams started as a Telephone Operator at the old Central Exchange, 49, Bennetts Hill, Birmingham, in June, 1891, she was one of eleven operators; now she is one of an operating staff numbering close on 200. After seven years' varied

ELIZA ADAMS.

experience in the old Central Exchange she was transferred to the Birmingham Jewellers Exchange as Operator-in-Charge, and in 1901 she returned to the new Central Exchange, Newhall Street, Birmingham, as Supervisor. On the introduction of monitors four years later Miss Adams was the first to be appointed to the new position. The growth of the business created a demand for operators in excess of the supply, and so led to the founding of an operating school. The Birmingham school was started in July, 1906, and Miss Adams was chosen to occupy the position of Teacher. In this position she was responsible for the training of the operators for the Central Exchange common battery extension opened in 1907, and also for the operators who started in the new Midland Exchange, Hill Street, Birmingham, in November last. In such recent additions to a telephone equipment as an operating school progress has been very rapid. The equipment of the school over which Miss Adams presided was primitive and crude, consisting mostly of charts with just sufficient apparatus to show the actual joining up of a subscriber's line to a local junction. The new school provided in the new Midland Exchange building in Hill Street is equipped with standard boards designed by Head Office and demonstrating both magneto and common battery working. When the new exchange was opened in November last Miss Adams was appointed Clerk-in-Charge, and there is every indication that

she will fill this position as she has done all the others, with credit to herself and satisfaction to the Company. As a result of her varied experience Miss Adams is an enthusiastic believer in common battery working, and regards it as unequalled for smoothness and ease.

In all the positions that Miss Adams has filled, especially in that of teaching, her influence has been on the side of cultivating as high a tone amongst the operating staff as is possible. Interested in the welfare of those over whom she has control, apart from the mere routine of duty, she has been instrumental in founding a book club for the operators in training. The books chosen are themselves proof of good taste and excellent judgment.

Like so many of her colleagues Miss Adams finds her recreation in change of occupation. Walking is her favourite physical exercise, but she counts herself happy in having the privilege of being connected with the famous Carrs' Lane Chapel, and takes an active share in the religious, temperance and social work which centres there.

XLIV.—ADA MAY LEWIS.

ADA MAY LEWIS was born at the Post Office, Ruardean, a picturesque village in Gloucestershire. Her late father was the first sub-postmaster at this place, having received the appointment at the early age of eighteen, and members of the family have now

ADA MAY LEWIS.

held the position for over half a century. In Miss Lewis's case, therefore, will be found a curious instance of giving up Post Office duties only to find herself again nearing the time when the Government may claim to control her services. Miss Lewis commenced her career with the Company in November, 1906, as Observation Clerk, at Swansea. This interesting work was especially appreciated by her both as regards the contrast in the nature of the calls and the enthusiasm displayed by the operators, who vied with each other to obtain the best results. In August, 1907, the Company purchased the Swansea Municipal Telephone System, thus possessing two large exchanges in which details of service had to be carefully observed and recorded. In June, 1908, Miss Lewis was transferred to Exeter as Clerk-in-Charge, and in this capacity finds the work equally interesting. Since Miss Lewis took charge at Exeter the service has much improved, and she is very popular with the public and the operators. Her previous experience on the observation table has fitted her well for the position she now holds. Miss Lewis is an ardent cyclist and confesses to a fondness for whist and dancing.

AN APPRECIATION AND ITS LESSON.

"THE rank and file of merchants and shopkeepers have not the perspicacity to properly appreciate even the excellent telephone service provided in the city."

These words are not those of a telephone enthusiast or of a zealous canvasser. Had they been, no comment would be necessary. But, forming as they do the concluding point of the argument of an article written by "A Leeds Merchant" in a local weekly magazine, on the "Want of Commercial Education," they are worthy of a deeper consideration, of a wider circulation.

They should be welcomed by the canvasser, give him renewed hope, stir him up to even greater efforts. Because therein is an admission that the propagandist work of the Company is becoming fruitful. The canvasser is coming into his own. He has toiled hard, he has urged incessantly, and his theme has been the suitability and utility of telephone service to every class and condition of the community. His voice, in the main, has seemed to be as one crying in the wilderness, his seed to have fallen on rocky ground, but if "A Leeds Merchant" speaks with any authority, and for any number of his compeers, especially they of the rank and file, then surely the winter is past, the summer is here, the fields are becoming white unto harvest.

They are, too, a recognition of that which for long the Company has been striving to instil into the public mind—that the telephone offers a good investment and return for money laid out; that it is absolutely essential to the man in a small way of business, as it is to the one in the largest; that success depends largely upon service, and no more efficient servant exists than the telephone; that joined to the exchange means also being connected up with the whole country, all its sources of information, all its resources of supply. They recognise also the improved apparatus, accelerated service, better attention, wider scope, fewer faults (the outcome of close attention to the important branch of working designated as traffic), the greater courtesy extended to the public, the benefits arising from taking the public more into confidence, the revealing of the intricacies of machinery and manipulation involved in the seemingly simple matter of connecting one subscriber to another, and especially the suitability of the various rates drawn up with a view to meeting the want of every likely user.

To telephone advocates it seems vain to repeat such trite remarks, but it must not be lost sight of that it is the constant reiterating, coupled with faithful and efficient performing in *act* of all that is stated in *word*, that has made the position of the present and gives the promise for the future.

NATIONAL TELEPHONE PROGRESS.

NEW exchanges have been opened at Clonsilla (Dublin), and at Mickleover, Derbyshire (Nottingham district), making a total now open of 1,558. During May there was a net increase of 2,201 subscribers' stations, making a grand total of 486,897.

An additional section of 315 lines is being added to the Oxford switchboard at present.

RECORD DESPATCH OF FEE ACCOUNTS.

IT will interest fee clerks throughout the country to know that it was found possible to issue all the Post Office fee accounts in the Edinburgh district for May on the morning of June 5—a Saturday. The totals were balanced with the Post Office fee journals and all the work accomplished without late working.

LONG-DISTANCE TELEPHONY.

FURTHER successful experiments, says the *Daily Telegraph*, have been made with the microphone invented by two Swedish engineers, which, as I reported recently, immensely increases the distance over which telephonic communications can be held. To-day conversations were heard between Stockholm and Paris and Sundsvall and Paris *via* Copenhagen, a distance of 2,270 miles. Efforts are now to be made to establish telephonic communication between London and Copenhagen through Paris.

The National Telephone Journal.

"BY THE STAFF FOR THE STAFF"

Published Monthly at

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THE TELEPHONE IN FRANCE.

THE telephone service in France, and especially in Paris, is still the cause of grave and unremitting complaint from the subscribers. The *Association des Abonnés* continues to conduct its energetic campaign against the Government, who seem in a sense to be alive to the seriousness of the situation, but only willing, or able, to apply the remedy of half measures. The lively monthly *Bulletin* which the association publish continually refreshes the memory of the French Post Office with statistics of the comparative expenditures on the telephone in America, England, Germany and France, pointing enviously to "cascades of millions" which are devoted to the development of the service in the United States as compared with the small amounts doled out by their own Government. The association do not omit to point out also that New York and its suburbs alone contain nearly twice as many telephones as the whole of France, and to draw conclusions. We print in another column some extracts from a report of M. CHAUTARD, deputy, reporter of the Parliamentary Committee on the Budget of the Department of Posts and Telegraphs, presented to the French Chamber of Deputies at the end of 1908.

This report deals with the estimates for 1909 and criticises severely the treatment of the telephone service by the Administration. It is only proposed to provide £440,000 for the telephones. This M. CHAUTARD stigmatises as entirely insufficient and simply a palliative. The truth is that the French Government fails to grasp the fact that the satisfactory development of a telephone system requires that capital shall be continually poured out for the purpose not only of extending the telephone in towns where a service already exists—and there is much room for this extension in France—and in extending to virgin districts, but also for the continual replacement and reconstruction of apparatus by more modern plant. The constant rebuilding of costly exchanges on the newest principles is a source of heavy expense which all progressive administrations have to face. Governments, however, are not easily brought to see that the liberal expenditure of capital on telephones is more vital to the commercial interests of a nation than the construction of Dreadnoughts or the increase of armaments. If this indispensable means of communication is starved and its development is allowed to fall behind that of rival countries, the commercial prosperity of a country will surely fall behind also.

The introduction of common battery working in Paris has encountered a difficulty peculiar to the French and some other Continental systems of rates. In France the subscriber was made to pay for the installation of his telephone, which became his own property. When, therefore, the Government established a central battery system they found themselves faced with the alternative of presenting every subscriber with a new telephone instrument or of allowing him to retain an old one, which, strictly speaking, was hardly suitable to common battery working. They have so far adopted the latter alternative. The question of rates engages the attention of M. CHAUTARD at some length. He champions the measured rate, complains that the flat rate causes the large user to enjoy his advantage at the expense of the small user, tends to overload the lines and block calls, and encourage the making of unimportant calls.

All this, of course, is only "what every telephone man knows." The rigid economy of a Treasury Department, superadded to the evils of a flat rate are grievous hindrances to the development of any telephone system. If our neighbours can soften the one and abolish the other we have little doubt that the telephone will speedily attain a position worthy of that occupied by other sciences and arts in France.

MR. BURNS AND THE TELEPHONE.

ACCORDING to the *Manchester Evening News*, Mr. JOHN BURNS is reported to have said that the Local Government Board is "too wise to be on the telephone," and that it was the only Government department not connected with the exchange telephone system, the reason being that the work of the officials would be interfered with by hundreds of enquiries. A progressive member of a progressive Government should be disabused of this antiquated and exploded theory. With a proper installation a man need no more speak on the telephone to another to whom he does not wish to speak, than in his private office he need see a man whom he is too busy to see, or who comes without an appointment. An extension station and an intelligent clerk or secretary are as effective excluders of the undesirable as the stoutest and most athletic footman, janitor, hall-porter, custodian or commissionaire alive. As regards the hard-worked governmental chief clerks or heads of departments they need be no more accessible to the telephoner than the casual caller. The question resolves itself to this; that on whomsoever in a Government office falls the onus of attending to those members of the public who call and "want to know" things, on him will devolve the task of answering the telephone.

The telephone is merely an additional channel of information, the most rapid, cheapest and the most direct known, and if increased inward communication carries with it a few additional enquiries, it carries also other invaluable facilities and an increased outward communication which more than compensate for any supposed drawbacks.

DETERMINATION OF THE NUMBER OF PAIRS OF WIRES REQUIRED FOR PRIVATE BRANCH EXCHANGE POWER LEADS.

IN Figs. 1 and 3 of the article in last month's JOURNAL, *r* should be read as equal to 200 ohms; it will then agree with the formula and the curves as actually plotted.

HIC ET UBIQUE.

Telephony gives an account of the art of telephoning in the quieter parts of Mexico. Senor Gomez is calling up Senor Rodriguez on a matter of urgent and pressing moment.

After fifteen minutes of vigorous grinding, the beads of perspiration began to glisten on Senor Gomez's brow. Then he was rewarded by the dulcet tones of the operator.

"Ah! Good morning, my dear Miss Central, how goes it with you to-day?" It takes possibly ten minutes to assure him that she never felt better in her life, after which the wheels of commerce begin slowly to turn.

"The favour of putting me in connection with number 100 is humbly desired."

"Yes, sir; *with much pleasure!*" responds the little Mexican operator in a voice saccharine with soft Spanish. Then if the line is not *ocupado* and if the party "humbly desired" is not out picking strawberries, they finally get together exactly like this:

"This is Senor Gomez. With whom do I speak?"

"With the house of Senor Rodriguez, at your service."

"Is Senor Rodriguez at home?"

"Yes, sir. Do you desire his presence at the telephone?"

"I do. Kindly say to him that Senor Gomez desires the pleasure of communication with him over the telephone for just one little minute."

Then Senor Rodriguez himself takes up the tale.

"With whom *do* I speak?"

"With Benito Gomez, at your service, sir. Good morning, friend Rodriguez. How are you this morning?"

"Well, I thank you. And how are you and your lady?"

"Well, I thank you. My compliments to your wife and family. Listen, friend Rodriguez; I beg your pardon for the molestation, but I was wishing to speak to you about ——." And again the wheels of commerce begin slowly to turn. After it is all over they ring off like this:

"A multitude of thanks, friend, for your information."

"No cause for thanks at all, my dear sir!"

"And a thousand pardons for molesting you so early in the morning." The clock had just struck ten.

"It has been a pleasure to chat with you."

"Well, *adios*, and a thousand thanks."

"*Adios*, may it go well with you!"

Do you wonder that it takes twenty minutes to get Central? You are lucky to get her at all!

A RECENT presentation to the conductor of the Elgin Amateur Orchestra, Mr. Alex. Allan, took a very novel form. The orchestra wished to mark their appreciation of Mr. Allan's enthusiasm and energy, and ordered from the National Telephone Company a set of private telephones. Mr. Allan's band evidently follows the *tempo* set by progress.

THE Company wished to establish a public call office in the Free Library of Swinton, Yorkshire. One councillor moved that the application should lie on the table. "If we have such a telephone," he said, "it will only be used for horse racing and such things." The worthy councillor has a flattering opinion of his fellow townsmen.

FROM the *Daily Mail*:

"Mummy, is Heaven on the telephone?" a child asked his mother one Sunday, "because I want to ask God if he really minds me playing a game," related Canon Ransford at Rochester Diocesan Conference yesterday.

A correspondent who sends us this cutting remarks that in justice to Contract Managers it should be pointed out that there is "another place" not connected, although some unkind critic may say that that is because the mechanical and electrical difficulties are too great.

THE *Zeitschrift für Schwachstromtechnik*, after quoting from our article on the private wire question that it follows inevitably from the learned law lords' interpretation of the Act that an electric bell wire is a "telegraph" over which B, C, D and others who push the button send "telegrams" to A, remarks that it is sometimes useful and instructive to cast an occasional glance into your neighbour's room. It may lead to the improvement of your own home. In conclusion it says: "The dictum of the Lords apparently rests on the idea there can be no one-sided interest in a signalling installation. If, however, a traveller in beer rings the bell at the gate of a total abstainer it is surely a little far-fetched if the 'addressee' of the 'telegram' has to pay for it.

"'Law becomes nonsense and good deeds a plague.'"

OUR Reading correspondent informs us that a lady who was recently being canvassed for a residence telephone in a small village in the Thames Valley told the Company's canvasser that she was particularly anxious to be connected by telephone in case of a foreign invasion. We regret to say that the good lady has not yet placed her order, and perhaps she has been reassured on the question of invasion.

THE 1909 Budget has been blamed for many things, but the Chancellor of the Exchequer will, no doubt, be surprised to hear that a caller at a public call office in Wallingford a few weeks ago, on being asked to pay the fee for a junction call, exclaimed, with a sigh, that he supposed the increase was on account of the Budget, and that there was no use grumbling.

TELEPHONY IN FRANCE.

THE following are extracts from a report on the Post and Telegraph Budget made by M. Chautard, deputy. The report was presented to the French Chamber of Deputies at the end of 1908, and deals with the estimates of 1909:—

It must be said that the numerous and justifiable complaints are deplorable; the disinterested advice and the expert opinions repeatedly advanced for years past have been entirely neglected. It is astonishing that at the beginning of 1909 the telephone service should be in exactly the same situation as it was seven years ago—in 1902. One cannot but deplore the efforts absolutely wasted and thrown away and the considerable sums of money spent in making things worse instead of in curing the evil. It is insufferable that this great State monopoly, of which the sole mission should be to provide the greatest facilities to the public, should be administered with such a sovereign contempt for the public requirements and with such complete lack of attention to the ordinary needs of the user. . . . To-day, as then, the public has to submit to long waits before the telephone instrument, to intense irritation, to furious calls prolonged beyond measure, and the telephone service is a confusion of angry discussion between subscribers and operators in which much insolent language is used, and often a polite employee is victimised by the abuse of an ill-mannered member of the public or a courteous subscriber is insulted by an operator who is over-worked and irritated by the constant disputes and has lost her self-control. Such is the picture of the Paris telephone service to-day.

M. Chautard pleads for the collaboration of the Administration with its customers, and regrets that so much time has been lost in useless evasions and hesitations. The partial conversion of Paris to the common battery working has not been altogether happy in its results, and the full benefit of this system will not be felt until the whole scheme is complete in 1909. The Money Bill to provide for the telephone service proposes £440,000! This, says M. Chautard, is entirely insufficient and simply a palliative. The entire question of the telephone service however, he says, is governed by the solution of the problem of the method of charging for the service. To improve the plant is a good thing; to maintain it well is better still; to select the staff with regard to special aptitudes, to train the staff well, to educate also the subscriber; all that is good, all that is even perfect, but all that is insufficient and vain.

The flat rate tariff, which is the rule in the large towns in France, prohibits a good service, however excellent may be the telephone staff and plant. This is to-day the unanimous opinion of technical experts and of telephone administrators in all countries. It is an opinion definitely and scientifically established and based upon the already considerable experience of the telephone service. The system of measured rates under which the subscriber pays in accordance with the number and duration of his calls, is alone capable of producing a service satisfactory to the subscribers, and at the same time it treats them with justice by making the payment for service proportionate to the service rendered.

M. Marcel Sembat, who reported on the Budget of 1902, found that more than half of the subscribers made an extremely small use

of the service. That majority paid for the others, the smaller proportion of the subscribers—the telephones in the great shops, for instance, and for subscribers who made an almost continuous use of the service. Consequently the small manufacturer and business man were deprived by the high tariff of its use.

The measured rate tariff, says M. Chautard, is democratic because it brings within the reach of everybody at a moderate price the use of the telephone service, which is to-day practically indispensable. But this system of tariff has the supreme advantage of assuring an efficient service. It results in reducing considerably the number of useless calls to an extent which is truly surprising. . . . The measured rate tariff suffices to insure a good service in spite of the considerable increase in the number of subscribers which results from its establishment. This is because in practice the inefficient service results especially from the overloading of the system at certain hours of the day by the excessive number of calls and the blocking, often for long periods of time, of the junction lines by flat rate subscribers who talk to an unlimited extent. Under a measured rate tariff these difficulties disappear, as has been shown by the experience of various countries, and in Berlin and London, for example, it is found that from four to seven measured rate subscribers do not tax the facilities of the plant to a greater extent than a single flat rate subscriber.

HEAD OFFICE STORES DEPARTMENT.

STORES.—STATIONERY.—TELEPHONE DIRECTORY.

By C. W. Salmon.

(*Concluded from page* 48.)

Cement Blocks.

Cement blocks were also examined, passed and stacked on the ground where they were made. The Company manufactured these in a yard admirable in every way for the purpose. They were made up with a certain proportion of cement and crushed granite, the premises being situated by the side of a granite quarry and crushing mills, so that the granite could be quarried, crushed in the mills to the required size and delivered into the Company's adjacent yard with very little delay. As the granite had to be sharp and clean in order to make good blocks, it was passed through a washing machine, so as to detach from it the sand and clay which is combined with it in its natural state. This washer was a long trough, inside of which was fitted a number of small spades spaced at short intervals from one another. The crushed granite was thrown into this trough at one end, and at the same time a quantity of water was kept constantly running through the washer, which was actuated by engine power, and when set in motion the movement caused these spades to alternately rise and fall and so gradually to work the granite down to the other end, from whence it emerged clean and ready for mixing, the water and soil extracted passing out into tanks, with the result that after allowing this mixture sufficient time to settle down the ingredients sank to the bottom, leaving the water above clear. This water was then pumped up by means of a pulsometer (also worked by the engine) to tanks fitted on the top of a neighbouring hill, from which it was conveyed again to the washer, thus saving some of the cost of water, which had to be paid for according to the quantity passing through a water meter. The granite, after being mixed with the cement and a certain amount of water, was worked up to the required consistency, and this preparation was put into moulds and firmly rammed down, the moulds were then taken apart and the blocks left to mature and get thoroughly hard, water being almost constantly played on them for a period of some six weeks or so, when they were considered as ready for use. The premises were very conveniently placed for both rail and water carriage, having the rails on one side and a canal on another.

Distribution of Stores.

And now we come to the second part of the procedure, that is, the distribution of stores to the various centres. I have already mentioned two of the sources from which stores are drawn, viz., the suppliers direct and Telephone House stores depôt. There are also two other directions from which they are obtainable, viz., from excess stocks at various centres and from stocks at the Nottingham Factory. As soon as requisitions are received they are sorted out under these headings, preference being given first of all to the clearance of any excess stocks that may be lying at the Company's centre or to stocks held by the Nottingham Factory, as of course those stores available in the possession of the Company should be used up before more are purchased. Next come the requisitions for those stores which are always stocked in Head Office depôt, those left representing stores which require to be purchased. These again are divided into two classes, one in respect of goods for which either "yearly" or "quantity contracts" have already been made, and the other comprising those for which special quotations have to be invited. Included in this last description are non-stock articles, which are of a most miscellaneous character, and stock articles for which no contract has been made. These latter are items which it has been thought advisable for many reasons only to buy as and when required, the chief being that comparatively few are likely to be wanted, and then only at intermittent periods; take, for instance, pitch pine poles and larch poles, which are only occasionally required, and even then these vary considerably in length when they are wanted. Quotation forms are sent out to those firms who it is considered are able to supply the type of article required at a reasonable price and within a satisfactory period, and are made returnable at a given date. These are all opened together by the chief assistant, who certifies on the tender which quotes the lowest price, and the order is then made out accordingly. Most of these requisitions for non-stock articles are referred to the Engineer-in-Chief before they are dealt with, and often much delay arises through correspondence having to take place on certain points with the districts concerned before the goods can be finally ordered.

The requisitions having been sent off to their respective quarters, the next question the department is concerned with is that of delivery. It has been generally found that delivery of goods in respect of which "yearly" or "quantity" contracts have been made is very rarely behindhand, and the almost total absence of urgency notes for the same testifies to the excellent results of the system in force. Not only are the stock orders I have already alluded to given to the suppliers some time before the goods are actually wanted, but periodically forms are sent out to the contractors requesting them to state thereon the quantity they have on hand, and these not only disclose how matters really stand, but act as a sort of stimulus to the manufacturers to keep up the quantity of supplies arranged for. Further, a careful watch is kept by the department as to the deliveries, and if they are found to be at all backward enquiries are instituted as to the causes, so that before delivery becomes really urgent all these precautions almost invariably have the effect of clearing away whatever difficulties may have existed. Of course, there are here and there occasions where delay occurs with regard even to these contract goods through some unexpected trouble being experienced by the contractors, and many and varied are the reasons adduced by them, such as the want of raw material

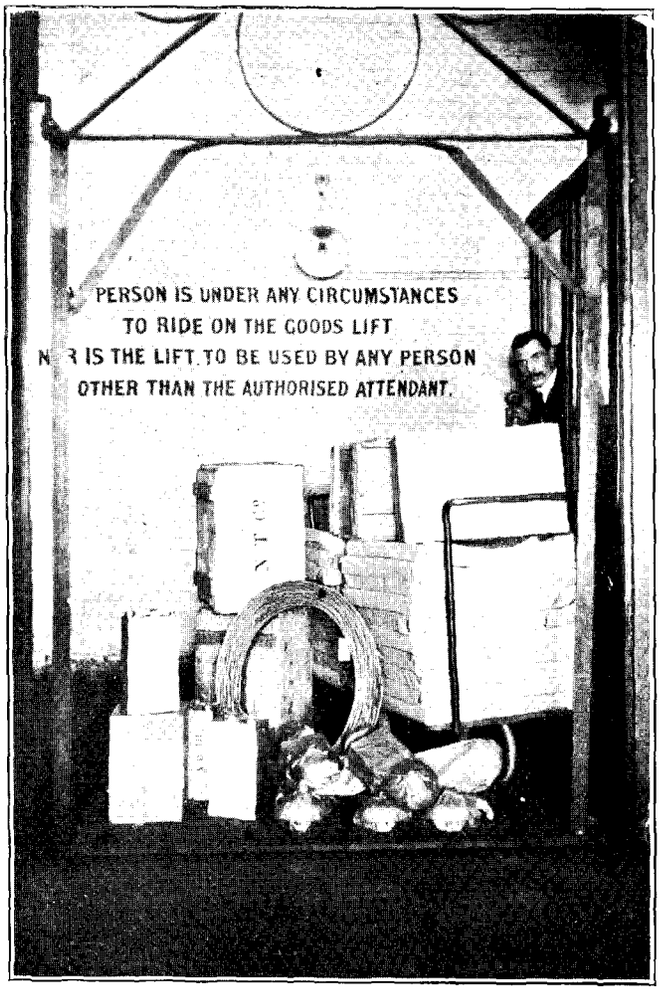


Fig. 5.

Goods lift (situated at rear of goods entrance), Telephone House, Victoria Embankment. This is a specially designed platform lift arranged to run between the loading yard on ground floor and the basement and sub-basement. It is operated by two push-buttons on each floor, one "up" and the other "down." The platform can be brought to any level within its range as it travels, but only whilst a button is depressed. The top entrance to the shaft is fitted with automatic gate, which opens as platform reaches ground floor and closes as platform descends. The following particulars may be interesting:—Maximum load, 25 cwts.; speed, 20 feet per minute; height of shaft, 18 feet 6 inches; motor, 6 horse-power 400 volts; size of platform, 5 feet 8 inches by 5 feet 2 inches.

through its being much overdue, or that the stuff although received has turned out unsatisfactory and fresh supplies have to be awaited, and so forth. But it is mostly in relation to items for which there are no such contracts and which have been purchased specially that delays arise, and generally speaking what appear to be excellent reasons are given for the non-observance of promises. There is no doubt that difficulties have to be contended with by the contractors which were not anticipated when the order was accepted, although I fear there have been occasions, when through easier and more remunerative work coming in, preference has been given to this over the special articles ordered by the Company, who certainly have the right to cancel any such overdue orders, obtain elsewhere and charge the delinquents with any extra cost caused thereby. In some delays, which seem almost interminable, there is a strong inclination to take this course, but one is confronted with the question as to whether or not it is wise to do so, and therefore much care and discrimination is requisite in determining the best line to pursue, as it would, in many instances, take much longer to get delivery from another quarter than the extended time that may be named by the maker who had the order. This would certainly be so where the firm in fault was the only one which had the necessary tools for making the article required.

SUBSCRIBERS' INSTRUMENTS AND SALES.

With regard to the section dealing with the subscribers' wall and table sets, sale of instruments and sale of scrap material: here are kept the records of the stocks of instruments for subscribers' lines which lie at the Nottingham Factory, also of the contracts for the same with the manufacturers. When requisitions for these are received, they are marked off to go direct from either of these sources of supply as may be expedient. Particulars are also prepared in this section for the publication of the catalogue of instruments, etc. for sale outright by the Company, which, as you are aware, comprises a large assortment of articles, and great care has to be observed that the prices charged therein are on a basis which will yield a fair profit to the Company, and yet bear favourable comparison with those charged in catalogues emanating elsewhere, and with this end in view, such outside price lists have to be carefully studied. The plan adopted in the last publication of issuing it in ten sections has proved very successful. It is not only cheaper but it is decidedly more useful, as anyone who desires to consult the catalogue for any particular description of article has simply to refer to that section containing the information respecting it. Special arrangements are made so that immediately on receipt of a requisition for sale instruments an order is telephoned through to the makers, who forward from stocks, which they undertake to keep in hand for such purposes, direct to the centre requiring them.

SCRAP.

With respect to the sale of scrap material, a very large quantity of this is sold during the year, good prices generally being obtainable for bronze and copper wire. These used to be kept separate in the stores, but as it was found on close investigation that no better price was offered than when mixed, it was decided to abstain from the trouble and expense of keeping the two different sorts apart. Of course better prices per ton are quoted when there are fairly large parcels than when only a small quantity is for sale. A complaint we have had recently from the buyers is that they have found iron wire and other foreign material mixed up with this scrap, and they state that unless this is detected before it goes into the melting the value of the melted metal is greatly reduced, so that it is essential that every effort be made to avoid this mixture in the stores, and so maintain the standard of price.

EMPTIES.

With regard to empties all contracts and special quotation forms stipulate that the Company will not pay for these, but it undertakes to return them carriage paid provided they are marked by the contractor that they require them returned. In some cases it is found cheaper to pay for the empties, as the cost is less than the amount required to be expended in carriage to return them. A considerable amount of correspondence is involved where empties are not sent back in good time, as the suppliers write in respecting them, when the matter has to be traced throughout. With regard to drums on which cable is wound, the Company agrees to pay for these if not returned after being six months in its possession, on the understanding that if they should be sent back within a further six months, the amount paid should be refunded, less 10 per cent. for the use thereof. After this date they are not returnable, but, definitely becoming the Company's property, are marked with its initials and numbered so that any particular drum can always be traced whenever it is necessary.

II.—STATIONERY.

Having now given you some idea of the methods employed in the Stores division, I will now proceed to enumerate the work of the Stationery, Printing and Directory division. Here again the duties are divided up into sections, one dealing with the stationery and printing and the other with the Telephone Directory. The same process is gone through as regards obtaining tenders for the year's supply for most of the schedule articles (numbering 1,300) as that for the stores, but in this case, instead of a number of tender forms each for different articles being sent out, a book (this year consisting of 33 pages) of schedule articles is issued. This is divided up into several parts, viz., books, forms, plain paper, envelopes, ink, pads and tickets, labels, writing materials, several other minor items, and sundries. These are supplied to the firms on the Company's list, who are at liberty to quote for all or any of the articles mentioned therein. The number of firms with whom the Company deals for its stationery supplies amounts to nearly 180. Specimens of the various items are exhibited, which can be inspected by the firms quoting, full particulars of the way in which the books are to be bound are given, and descriptions of the papers that are to be used, together with the weight of paper per ream. After the tenders have been scheduled up and the successful contractors notified of their acceptance, patterns are sent out to them, they can proceed at once with the preparation of supplies so as to be able to forward them on receipt of order. The goods are sent to and put into stock by the central depôt at Telephone House as and when required. A proportion of the heavier classes of goods are sent away to the centres direct from suppliers, where the quantities are large enough to warrant this being done. Before being received into stock all deliveries have to pass through the hands of the examiner of stationery, who is attached to the staff of the stationery division, and whose duty it is to satisfy himself that everything used is in all respects equal to the standard pattern and particulars to which they were ordered. With regard to paper, whether it is plain, ruled, in the shape of printed forms or contained in books, he is required to see that this bears the correct water mark, that it handles properly and is of the right weight, texture and colour; the weight desired being ascertained by means of special scales for this purpose, which are so constructed that by weighing a single sheet the weight per ream is at once shown by means of an indicator which is affixed to the machine. In addition to this he sees that the printing is well done, and also where books are concerned, not only that the paper, printing and ruling in same is correct, but that the binding and general finish is satisfactory. The other many articles, such as pencils, pens, rulers, scissors, letter baskets, etc., are carefully compared with the regulation patterns and approved before they are accepted and paid for. Wherever it is possible to do so the initials of the Company are stamped on articles.

PRINTING.

As an auxiliary to the equipment of the stationery division, mainly for the purpose of printing matters of a confidential character and those forms, etc., on which the various addresses of the Company's offices have to be shown, a printing office is installed under the charge of a competent overseer with a staff of compositors, machine minders, cutters and packers, and is conveniently situated at the other end of the floor on which the stationery depôt is located. As its work is to a certain extent typical of that of the numerous firms supplying the Company's requirements, I propose to give you a few details concerning it. Here the letter paper, fee account and rental account forms, envelopes, labels, etc., are printed. Four machines, worked by electric power, are fitted. The largest one can print eight sheets of paper or eight fee account forms at a time, that is to say, eight of these account forms are set up by the compositors, and are all placed in one frame, called a chase; sheets of

FIG. 6.

Compositor at Keyboard of Monotype.

paper, each large enough to cover the whole of this chase, are then passed through the machine, and at each revolution the whole eight account forms come out printed. As this machine runs at the rate of 1,800 revolutions per hour, 14,400 of these forms can be printed in that space of time. As each sheet is printed it is automatically cut into half, each sheet then representing four account forms. When a quantity of these have been printed off they are taken to the cutting machine (called a guillotine), which is capable of cutting through a solid stack of paper 25 inches wide and 6 inches thick (this thickness is the maximum for any paper guillotine made), and are then divided into single account forms. Exactly the same process, of course, is carried out with regard to letter paper, etc.

The next-sized machine can print four of these forms at a time, and is used for the smaller quantities required. This runs at the rate of 1,600 per hour and prints 6,400 account forms per hour.

The third machine can print two such forms at a time and is used mostly for printing addresses on the larger-sized envelopes, small forms, visiting cards, etc., and runs at 2,500 per hour.

The last machine can print only one form at a time, but runs at a very high rate of speed; on this the smaller-sized envelopes are printed. It is nearly always employed on this sort of work, printing as many as 4,500 envelopes per hour. These are simply placed in a stack on the machine, which is started, and watched by a minder; it automatically picks up the envelopes, one at a time, prints and delivers them in rows, so that they can be collected and packed up for issue. Although these machines are never idle, constantly pounding away, turning out some 200,000 fee account forms, a quarter of a million sheets of letter paper and about the same quantity of envelopes per month (all steadily on the increase), only about 8 per cent. of the Company's supplies are dealt with by their agency, but that which is done results in a very considerable saving of expense. This description of work, involving so many changes on the machine caused through the number of different addresses, is generally highly charged for by the outside printers.

The printing office also contains stitching and eyeletting machines for use when this sort of work is required to be carried out; also the duplicating machine for printing off the circular letters issued from Head Office, which can produce copies at the rate of 2,500 per hour, feeding and delivering automatically.

STATIONERY SUPPLIES.

All centres keep a three months' stock of stationery and can requisition monthly for further supplies. In order, therefore, to enable those in authority in each district and also the Head Office Stationery Department to see at a glance what is being asked for from time to time by each place where a stationery stock is kept, a schedule, containing particulars of every stock article, is supplied to each of such centres. This is sent up by the district office each month (together

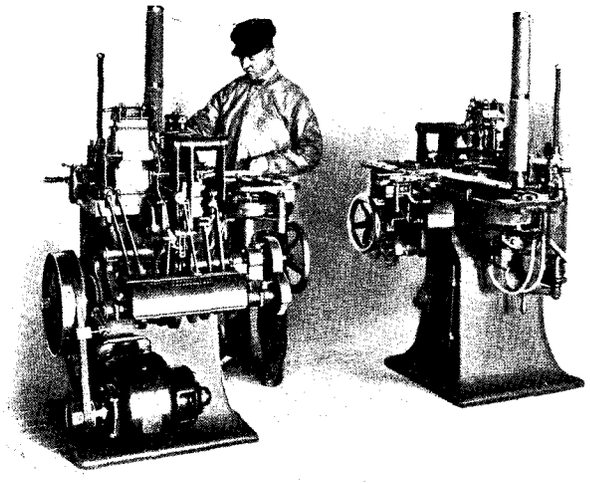


FIG. 7.
Casting Type for the Telephone Directory.

with the requisitions), showing in the column for the month what is requisitioned, and as these columns get filled up month after month a study of these particulars can be made, and any anomaly in the quantities asked for can be observed.

A further advantage is this, that it enables the quantities that it may be decided to ask for, at various times during the month, to be at once marked against the items, and at the end of the month the whole schedule can be run over to see that nothing has been overlooked. It can then be relegated to a junior to make out the requisitions accordingly. The fact that all items upon these latter are thus made out in consecutive schedule order is, of course, very helpful to the centres in many ways, and is of great service and indeed essential to Head Office, as the same order in which the items appear in the schedule is also observed in the arrangement of the actual stocks of goods in the depôt and in the keeping of the stock accounts in the office. It therefore follows that much trouble and time is saved, not only in the work of issuing but in the entering up of the stock accounts.

The number of centres keeping stocks of stationery is 214, and, instead of having the whole or larger part of the requisitions from these places coming in at one time, and so causing congestion and the lapse of a considerable period between the date some articles would be requisitioned for and that on which they could be despatched, arrangements are made by which each office sends in its requisitions on an appointed day each month. This enables the Stationery Department to spread its work evenly over the month, and thus deal better with the general requirements. On receipt of the requisitions they are entered up in the register and then sorted into three classes—

(1) Those for articles stocked in the depôt, which are sent off to the depôt for issue. For items to be sent direct from suppliers' works, orders are made out accordingly.
(2) Those for forms, accounts, etc., which are to be printed on the premises, in respect of which orders to the overseer are issued.
(3) Articles for which prices have to be obtained.

With regard to the latter competitive quotations are asked for, and when prices have been received and considered orders are duly sent off to the successful competitors. These articles are of a most varied character, and include certain books and forms, card index cabinets, and cards for the same, special circular letters, pamphlets and special printing matter for contract officers, and advertising matter generally: and indeed with the negotiations which necessarily arise in dealing with these matters a very considerable portion of the time of the stationery division staff is taken up.

TELEPHONE DIRECTORY.

I have at last come to the remaining section on which I propose to speak to you to-night—namely, that dealing with the Telephone Directory. This has now grown to very large proportions, and is still steadily increasing in bulk. Only a few years ago it was printed with one column of 67 names on each page, the total number of columns being 3,000; whereas now it is printed with two columns on each page, each column containing 104 names, the total number of such columns amounting to 5,500. The contract with the printers is necessarily of a complicated character, so many points having to be arranged for. There are no less than 109 different prices dealing alone with the rates to be charged per page, as the prices vary in proportion to the number of pages in each book, and the number of such books printed; so that when the issue has been completed and the account comes in for payment it needs very close scrutiny indeed before it can be certified as correct. Then there is the contract with the advertising contractor: this includes a wide range of amounts payable to the Company under certain circumstances, and also provides for many eventualities, and here again great discrimination is requisite to see that all the conditions are duly observed.

The issued of the directories twice yearly involves a constant stream of work throughout the year, for as soon as the business connected with one issue is completed, and sometimes even before then, preparations have to be put in hand for the next one. The printers have to make forward arrangements, more especially with regard to the paper, which is made specially for each edition. A very substantial quantity of this is required, that for the London books alone weighing over 100 tons. About three months before the date of issue particulars are collected from the districts as to the number of directories it is estimated will be required; it is, of course, necessary that this information should be most carefully prepared, for it may mean that either large quantities are left over at the end of the period which the edition serves, which means so much money lost, or, on the other hand, not sufficient being printed, in which case the cost of a reprint has to be faced—both undesirable alternatives. In addition to these figures from the districts, similar information is supplied by the

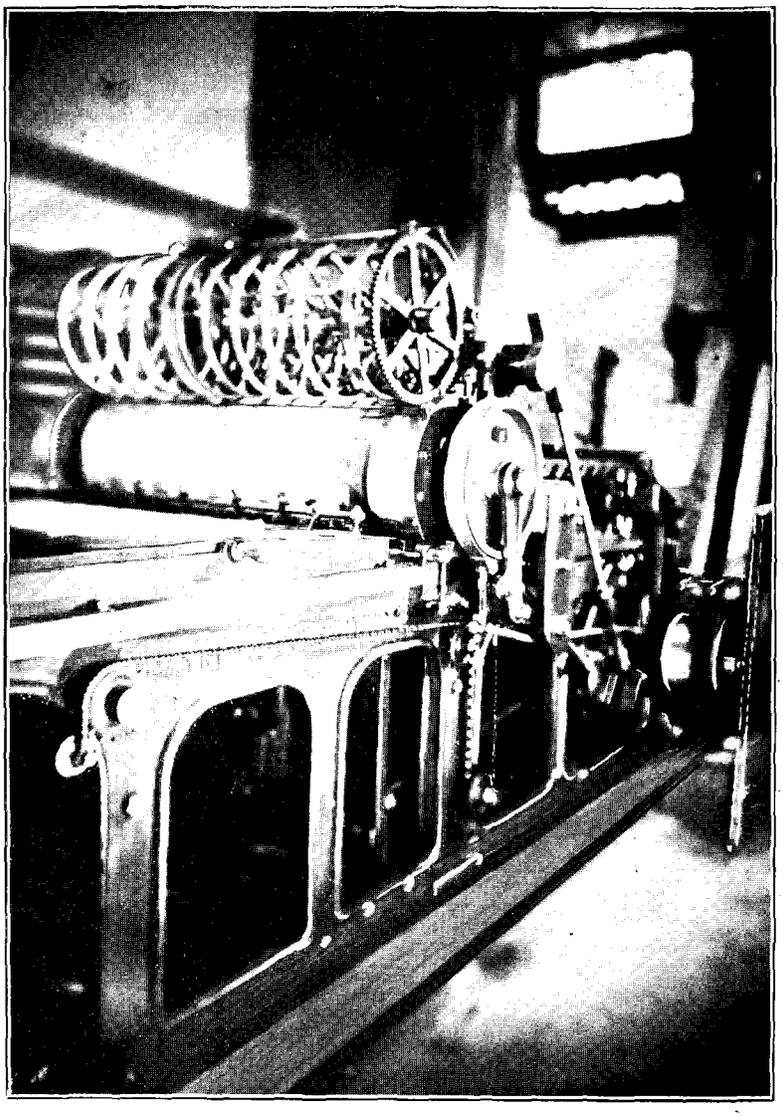


FIG. 8.
Double-Demy Printing Machine used in Printing Office, Telephone House, Victoria Embankment.

Post Office for their directories, as all the Department's subscribers are included in alphabetical order in the books issued for those places where Post Office exchanges exist, thereby enabling the Department to be supplied with their directories at a much cheaper rate than if it were to have the books printed independently.

When all the returns come to hand they are carefully studied and criticised by the directory staff before instructions are finally handed to the printers. The next requirement is the "copy" from which the new edition is to be compiled, and this is sent in about two months before the date of issue. The arrival at about the same time of the returns from 55 districts, together with the "copy" referring

to Post Office subscribers, imposes a severe tax upon the energies of the staff, as they have to examine all the "copy" before it goes to the printers, to whom it must necessarily be forwarded with the greatest promptitude. Any instructions which it may be necessary for the printers to observe are noted by the directory staff on this "copy," and when it is returned with the proof, before being sent on to the districts to check, it has to be seen that these notes have been given effect to. After making any further remarks on the proofs that may be necessary for the guidance of the districts concerned they are then forwarded on, and a date is given for their return. A time table is always arranged with the printers so that their work and that of the Company synchronises, thus enabling matters to proceed with advantage to both parties.

The setting up of the type for the main part of the directory is not done in the ordinary way, but by means of a method of mechanical composition called the "Monotype," which is most ingenious. It consists of two separate machines, one for composing the "matter" and one for actually casting the type to be used in printing. The first-mentioned is similar to a typewriter in that the pressure of different keys causes various holes to be punched in a stout paper ribbon, which holes indicate certain letters, figures or signs. This punched ribbon is transferred to the casting machine, which not only casts separately a type for each letter, but forms up the type into lines in the same order as they appear on the paper ribbon. Twelve composing machines and eight casting machines are used for the directory work. Owing to the desirability of getting as many of the latest subscribers' names as possible in the directory a comparatively short time only is available for the work to be carried out, a period of two months elapsing between the date the "copy" is sent in and that on which the books are issued, so that practically the whole of the work has to be condensed into that time, and this necessitates a large number of hands being employed by the printers while it is in progress. Some 200 compositors are required to deal with corrections and alterations, which have to be done by hand alone, and 40 readers have to work on the proofs. The total weight of the various proofs printed is estimated to be over one ton.

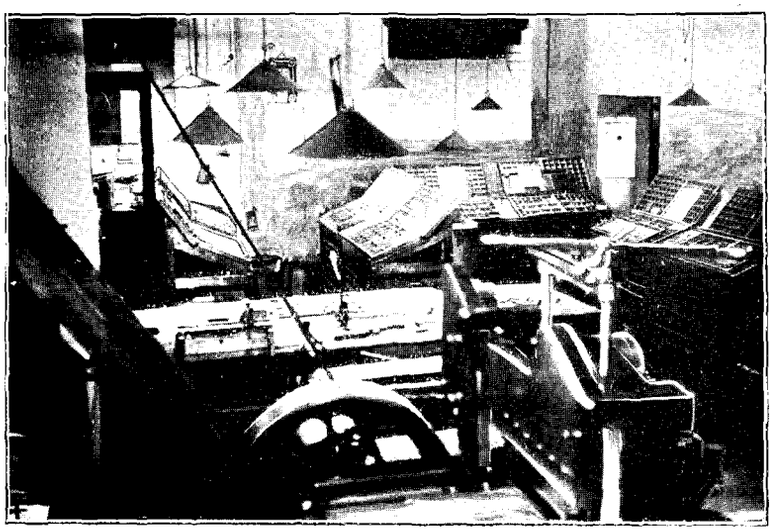


FIG. 9.

Compositors' Section of Printing Office, Telephone House, Victoria Embankment.

All the type-setting, etc., is done in the printers' London house, but not all the printing, the contractors distributing this amongst six of their works, situated in different parts of the country. When the setting up of the type, weighing altogether 22 tons, is completed, light *papier-mâché* moulds from the face of the type are made up and sent off to these various branches, where plates in exact reproduction of the type are cast from the moulds, and after being properly prepared they are put on to the printing machines (70 of which are utilised for the purpose), and thus in a few hours after the moulds have been despatched the whole of these establishments are busily at work printing off the directory matter. The contractors also have to take on specially quite an army of girls and men, the former for the purpose of stitching together the books and fixing on the covers, and the latter for packing up the parcels for despatch to the different addresses.

The foregoing will perhaps give sufficient information to indicate the labour which is involved in the production of these directories, nearly 590,000 of which were printed off in the last edition. The quantity required in the course of the current year will therefore number over a million copies, and only the organisation and expedition that obtain render it possible for such a vast amount of work to be successfully carried through within the stipulated time.

Turning to the advertisements which appear in the directory, throughout the whole of the year, numerous orders for "extra names," "extra words" and "special type entries" are filtering through the department, either from the districts for transmission to the advertising contractor, or from the latter for reference to the districts for certification, to be returned again, through the directory department, after this has been done. During the time the proofs of directories are in hand, large batches of proofs of "displayed advertisements" are being received, and as these cannot be inserted until sanctioned by the Company, it is one of the duties of the directory staff to examine and approve the wording of each one, so that nothing objectionable is allowed to go forward. Further, the department has now and then to revise the tariffs charged for these advertisements, and as the cost of the printing of each advertisement is continually increasing, owing to the larger number of books being issued, it is imperative for the rates to be most carefully watched to see that the proper margin of profit is being duly secured.

Of course, many of the points to which I have alluded could be amplified, but space will not permit of this being done; as it is, I trust my remarks will not have proved of too voluminous a character for your digestion. I have carefully endeavoured to avoid all technical terms as far as possible, so that everyone may be able thoroughly to understand all that I have been saying, and in conclusion I venture to express a hope that I have been successful in conveying some connected ideas of many of the methods in vogue in the department I represent, and that what I have recounted may, in the words of the secretary of the Bristol Telephone Society, "have a beneficial effect in the office dealings," a sentiment with which I am sure we are all prepared to agree most heartily.

LONDON NOTES.

THE new committee of the London Telephone Society has now appointed its sub-committees, so that matters may be put in shape for next session. The work is divided amongst five sub-committees, viz., papers, library, elementary lectures, finance and organisation. The two last-named are new, but are certainly necessary. The organisation committee in particular is looked to for a useful record, particularly in improving the attendance and increasing the membership.

THE opportunity of meeting colleagues from other parts of the country at the Officers' Annual Gathering is always looked forward to by the London staff. Those of the latter who obtained much of their training and experience in the provinces, and they are fairly numerous, particularly welcome the exchange of notes and greetings thus rendered possible once a year. A number of the diligent amongst the visitors found their way to Salisbury House and some of the Metropolitan exchanges. We should have been glad to welcome more of them and give them points.

MR. H. G. CORNER, of the Traffic Department, has been re-elected chairman by the Metropolitan Staff Transfer Committee. The appointment was made at a largely attended meeting of the new committee.

WE congratulate the Metropolitan Engineer on having received his commission as lieutenant in the Electrical Engineers (London Division). Lieutenant Shackleton's many friends are sure that his Territorial duties will be discharged as efficiently as his telephonic, and with the same geniality and *bonhomie*.

MR. H. DAVIS, the Metropolitan Stores Manager, has now recovered from his severe attack of pneumonia. It is a great pleasure to have him on duty again.

WITH a view to increasing the circulation of the JOURNAL a special committee of chief officers has recently been appointed. They have now obtained members of the staff in the various districts to act as agents, and it is hoped that in this way a stimulus may be imparted to the JOURNAL sales. It is felt that the opportunity of purchasing a copy each month ought to be given to every member of the staff. The personal interest in the matter of someone on the spot is the best means of accomplishing that.

WE have been expecting a fixture card or report of matches from the Avenue Cricket Club, but none are to hand. We remember a successful concert got up by the club a few months ago and since the cricket season opened have been looking for some chronicle of their activities at the wicket. We shall be glad to hear from the secretary.

MR. C. MORRISON, of the Statistical Office, was married on June 19. A clock has become the recognised medium of congratulations and good wishes at the Metropolitan offices on such occasions. Tradition was duly observed by the bridegroom's friends on the staff. We join them in wishing him much happiness.

ANOTHER presentation during June was to Mr. J. A. Godwin, Inspector, Bank Exchange. After eight years' service Mr. Godwin resigned to take up an appointment in the Malay States. The handsome kit bag subscribed for by the Bank maintenance and traffic staffs and a few friends at Avenue was appropriate and useful. It is hoped that the recipient will have all good luck in his new position.

CONGRATULATIONS to Mr. J. H. Bigland on his promotion to Divisional Contract Agent, City. Mr. C. H. Brandreth, formerly Private Branch Exchange Officer, replaces Mr. Bigland at Gerrard; we hope his "prospects" will be bright and his orders many. Mr. Bigland's staff in the Western district presented him with a gold watch-chain as a token of their esteem.

THE recent Stock Exchange boom has caused a welcome briskness in the City Contract Department. This is all the more appreciated as usually new orders begin to show a downward tendency in June. Everybody concerned is prepared to give up holidays if the rush continues. Further evidence of booming business comes from London Wall Exchange, where, at the beginning of June, the calls per week reached 578,000, as compared with 547,000 a month earlier. The night traffic also increased by over 50 per cent., conclusive proof that the energies of the Stock Exchange men were not exhausted by the turmoil of "the

House." One notable effect was a great demand for operators to work subscribers' private switchboards, so that the subscriber's own staff might be released for other duties. As the London season is also at its height, thus increasing the load at all the West End exchanges, the resources of the Traffic Department have been well strained in coping with the demands upon them.

SINCE the new Gerrard Exchange was opened a little over eighteen months ago, 1,229 visitors have been shown over. While this is fairly gratifying, we hope that the total will be considerably augmented. It is, of course, a truism that a visit to the exchange ought to be part of every subscriber's education. One wonders how many subscribers have ever thought that the telephone training is not required at the Company's end only.

THE pathetic story of Miss Adelaide Wilson is doubtless known to many readers of the JOURNAL. The young lady was an operator at Harrods' private branch exchange, and while cycling to business was thrown under an electric car. The result of her terrible injuries was that she was rendered a cripple for life and incapacitated from earning her living. The *Daily Mirror* generously started a fund, the major portion of which will be devoted to purchasing an annuity for the unfortunate girl. Mr. Ward, the Kensington Exchange Manager, has interested himself in the case, and at his instance a collection was made amongst the various Metropolitan departments; £55 9s. 7d. was thus subscribed. As many sympathisers have forwarded donations to the *Daily Mirror* fund, Miss Wilson's future will doubtless be sufficiently provided for.

THE North and East Exchange Districts have recently been divided, and an additional Exchange Manager appointed with headquarters at Dalston. The exchanges in the new division are Dalston, Tottenham, Walthamstow, Chingford, Chigwell, Loughton, Wanstead and Woodford. This is one of many evidences of the growing volume of traffic work in London.

FOR a number of years an annual collection has been made amongst the staff for the funds of the Royal National Lifeboat Institution. The sheets for this year have just come in, and show the gratifying total of £28 6s. 9d. It is an interesting fact that the amount collected in this way from the Company's staff throughout the country exceeds the amount obtained from the employees of any other firm in the United Kingdom.

THE engineers and maintenance staff at Paddington had a very successful outing to Broxbourne on May 12. Although the cricket match had to be abandoned on account of heavy rain in the morning, the boating which was indulged in later in the day was generally enjoyed. A tea and smoking concert ended a most enjoyable gathering. Messrs. Jennings and Gater were the organisers.

MR. J. O. ROBERTSON, the Local Engineer at Tottenham, has completed 25 years in the Company's service, having started in Aberdeen on March 1, 1884.

WE regret that by an error "the Misses Knapman and Miss Knapman" were mentioned last month as prize winners at the Bank Exchange whist drive instead of the Misses Knapp and Mrs. Knapp.

GLASGOW NOTES.

A SOMEWHAT unique meeting of Glasgow telephone men and women took place in the Union Halls, West Nile Street, on the evening of Wednesday, June 2. Mr. Valentine occupied the chair and, after tea, he referred in a short speech to the purpose of the meeting, which had been arranged as the result of a desire on the part of the staff to offer their congratulations and best wishes to four of their number—Messrs. Mackie, Gilchrist and Watt, and Miss Keir. Chief Inspector Mackie joined the service of the Company on March 10, 1884, so that he has just celebrated his semi-jubilee, and it was fitting that such an event should not pass unrecognised. Mr. Mackie had proved himself a faithful and a loyal servant and it was hoped that he might have many more happy years of active service. Mr. R. F. Gilchrist, Cost Clerk, and Miss Josephine R. Keir, Chief Typist, had decided to join forces and were about to be married. Both had proved themselves faithful and capable in their positions and wishes were expressed that the union would be a very happy and prosperous one. Mr. A. M. Watt, Outstandings Clerk, had received an appointment on the Head Office audit staff and was therefore leaving Glasgow. Mr. Watt had not only filled several important positions in Glasgow but he had also taken a leading part in promoting opportunities for the social intercourse of the staff. It was hoped that Mr. Watt would have much success and much happiness in his future career. On behalf of the staff, Mr. Allan presented Mr. Mackie with a gold albert and pendant; in the unavoidable absence of the Chief Clerk, Mr. McDonald presented Mr. Gilchrist and Miss Keir with a silver tea and coffee service, and Mr. Thyne presented Mr. Watt with a kit bag and travelling rug. The recipients suitably expressed their appreciation of the good wishes conveyed and the gifts presented, and a varied programme of songs, readings, etc., was then proceeded with. A triple presentation of this kind is by no means an everyday occurrence and we extend to the principal parties thereof our hearty congratulations and best wishes.

AT a meeting of the Glasgow staff held recently it was decided to form a bowling club, the games to be played on the Glasgow Corporation Bowling Greens, and already 75 members have joined. Messrs. W. S. Mackie, A. Anderson and J. Forrester were appointed president, secretary and treasurer respectively, and Mr. Anderson will be pleased to hear from any members of the staff who have not yet joined the club and are desirous of so doing. The annual subscription is the nominal one of 6d. It is proposed during the season to institute competitions amongst the members, and already a "Pairs" competition has been entered upon. In this connection it is pleasing to add that the president has very generously presented a pair of handsome bowls to the club.

THE Glasgow staff held their annual picnic on the Victoria Day holiday, May 20. A company of 60 journeyed to Arrochar, Loch Long, where sports where indulged in, in brilliant weather. Dinner and tea were served in Henderson's Hotel. The staff committee is to be complimented on the success of the undertaking.

AT the evening classes at the Technical College, session 1908-9, Mr. Thomas Pettigrew, of the Electrical Department, obtained first prize in the telegraphy (honours) course. Mr. Robert Brough, of the Electrical Department, obtained first prize (honours) telephony and second prize for electrical engineering (second year's laboratory). Mr. Wm. Stewart (Engineering Department) obtained third prize (honours) telephony. Mr. Jas. Y. Hutchinson obtained first prize both in telephony (ordinary) and telegraphy (ordinary), first prizes both in electrical engineering (laboratory first year) and lectures (first year). In ordinary telephony Mr. Thos. McIndoe obtained second prize, and Messrs. Alex. McLean and R. P. Crum third prize (equal). In electrical engineering (laboratory work, first year) Mr. D. G. Graham obtained third prize. A number of other students from the Glasgow staff obtained first-class merit certificates in the various courses.

CORRESPONDENCE.

TELEPHONE SOCIETIES.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

MR. COHEN'S article in this month's JOURNAL will no doubt cause many to question whether our telephone societies are as useful as they might be. I am forced to the conclusion that the junior members do not receive the benefit from them that they are believed to. Putting aside the fact that the younger members of the staff are most in need of a considered curriculum, such as the technical schools provide, they might still receive much practical benefit from the telephone societies if the writers of papers threw into prominence the prime facts of a matter and did not hide the points of importance in a quantity of detail. This is Mr. Cohen's chief complaint, and it is a matter of vital importance, for, apart from the difficulty of making use of the matter thus set forth, all get an example from the platform of that missing of the chief consideration, which is responsible for delay in business and inefficiency in organisation. Could not the telephone societies encourage the right spirit by offering prizes for papers by the junior members, not on the work of any department, but on some such subjects as "A Method of Study," "The Use of Principles," or by asking for a description of original work, no matter how simple, that has been carried out by the member, and judging the same from the point of view of brevity, of lucidity, and logic? The student would then have to ask himself questions that he must settle, unless he is to remain a mental junior ever, and to pursue methods that he must acquire if he is to extend his sphere of usefulness.

As illustrating the necessity for education in the subjects mentioned above, there is an unprofitable tendency for young technical men to study such literature as the *Patent Journal* to the neglect of those books in which the principles of things are enunciated; and as to the use of principles, do we not frequently find men using arithmetic to satisfy themselves that "Ohms" law, for instance, has not lapsed from the things that are, when—had the principle that the law lays down been securely held—the matter might have been settled mentally and immediately.

6-8, Marshalsea Road, S.E., June 15. W. BLIGHT.

THE JOURNAL'S ATTITUDE TO CONTRACT WORK.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

To ordinary intelligence the fact would seem to be conveyed that the Editor, in his footnote to Mr. Coulsell's letter in the last issue of the JOURNAL, rather disproves the suggestion he evidently intends to convey, which is that Contract Departments obtain a fair field in the pages of this paper. If so, why use the editorial blue pencil on every allusion to this department from the article he quotes, and which he states "contains several references to the Contract Department in its original form," and yet allow no less than four columns of the issue to be used up in putting before all his readers an article admitted by its writer to be only an address for a local telephone society? It may be that the references to the Contract Department, so carefully excluded by the Editor, were of such a severe nature that he deemed it expedient to keep them from his readers. If this be so, I am grateful; but personally I should have preferred dealing with the allusions if necessary.

Brighton, June 11. D. WALLACE, Contract Manager.

["Ordinary intelligences" will no doubt appreciate that papers which occupy a session of a telephone society in the reading are too long for insertion in the JOURNAL unabridged, unless they are of especial importance. Mr. Parsons was consequently asked to condense his article, and did so. One or two further excisions were made by the Editor. The paragraphs blue pencilled apparently contained some allusions to the Contract Department. It need hardly be explained that they were struck out, not *because* they alluded to the Contract Department, but because in their relation to the subject matter they appeared most capable of condensation. The Editor is always willing to publish any good articles on Contract Department work which may be submitted to him.—ED. "N. T. J."]

LONDON NOTES.—JUNE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

"J. S." makes an excellent trumpeter for London, but it does not follow that the Nottingham "lambs" will accept him as their judge without enquiry as to his identity or qualifications.

We shall be glad of the following information:—

Has "J. S." ever visited Nottingham Factory? If so, will he be good enough to detail the "points" which Dalston workshops may give to the "powers that be" at Nottingham?

We are as eager to learn and acknowledge methods which are superior to our own as we are to render any assistance to others which experience has taught us, but modesty prevents us from entertaining the idea that we are in any way superior to other departments of the service.

Nottingham Factory, June 7. CHAS. E. FENTON.

OFFICE WORK AND ITS RELATIONS TO THE STAFF.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

WITH reference to the letter from the local manager at Brighton in the June issue, after carefully perusing Mr. Parson's address to the staff in the May issue, I cannot find that the local officers in the Sussex district are mentioned at all. I take it that readers of the JOURNAL of average intelligence will take the remarks in the spirit in which they are given. No doubt Mr. Parsons has had considerable experience in connection with local office work in other districts beside Brighton. It seems as if the guilty feeling and home truths have somewhat disturbed the mind of the writer of the previous letter.

With regard to labour slate and man-hours, there is no doubt that up and down the country many works orders are returned to the district office with the information supplied blank, and, ignoring the question of economy and outside supervision, it would be interesting to know by what means Mr. Roberts would supply information on a batch of works orders, say, two months old, from which he had omitted to state the man-hours, without going through the very tedious process of again analysing the time sheets. With regard to monthly estimates, it may be that both the district and local offices were open to criticism in this matter, as it would appear that the job in question was one of those which might have been held in abeyance for years, and the proper procedure would have been to leave this off the estimate and apply to the district manager for a supplemental grant, when no doubt after considering the matter it would have been passed forward to the proper quarter.

With regard to stores, Mr. Parsons states that the recoveries ought to agree to a large extent. Mr. Roberts exaggerates his remark by saying the recoveries should be practically equal. There is a large difference between these two terms, and it is fair to assume that, taking an average monthly works order, the recoveries should equal, say, 60 per cent. of the wire issued In dealing shortly with stores matters, it is not possible in a paper to take all the little details which are obvious both to the chief clerk and local manager. Mr. Roberts appears to overlook the principal points of Mr. Parsons' paper, which are:

1. That the staff who actually do the work should be encouraged to give as much detail as possible when doing their little clerical operations.
2. That the office staff who are not cognisant of the operations of the electrical and engineering staff should be encouraged to obtain as much information as possible to enable them to reduce the risk of error to a minimum.

I am afraid Mr. Roberts looks upon the paper as a personal matter between his own office and the district office, which altogether upsets the principle upon which the paper was given.

June 14. P. R. COCKREM, Cost Clerk, Nottingham.

THE VALUE OF THE UNSUCCESSFUL INTERVIEW CARDS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

As Mr. Cooper seems to take it for granted that all replies to his article, headed as above, were written by fellow contract managers, I wish to disillusion him so that my (perhaps) previous indiscretions may not be attributed to a wrong quarter. "Northern Province" is a contract officer and, like most contract officers, suffers from an excess of modesty, hence the *non de plume*. The veiled sarcasm in paragraph 5 of Mr. Cooper's article will have raised many a smile at my expense, but in this I can also join, though at the same time I can assure Mr. Cooper that I, too, had in my mind that the subject under discussion was "interview cards" and not ruminations of a contract officer on architecture. If Mr. Cooper will read my contribution again he will see that I did not say the words "No good," etc., were the exact words that had not to be used, but rather that such short, choppy coupling of two words were to be avoided as they were not reports of interviews. "No good" is certainly not *a report of an interview* but appears to be a comment of a contract officer, even although he may have been *inside* the person's premises; but as this is a mere quibble over words I will leave it to the readers to decide whether such are reports of interviews or not.

Mr. Cooper says he "thinks" that I have not quite understood he was discussing interviews, etc. I should be pleased to have the part of the letter pointed out to me which leads him to think otherwise, for I am not a believer in "outside inspections" and do not advocate such.

In the last paragraph but one Mr. Cooper says I assume that he was also discussing the new business cards. That assumption is correct, and as it is considered wrong I would refer him to his article in the February issue, where he says, "there still remains to be considered whether the keeping of these cards (unsuccessful interview cards) with the new business, call office and cessation cards, etc.," and then ventures to think that they have no practical value, saying, "after all, the record of what has been achieved will not assist in getting us new subscribers," etc. If the object has been achieved it looks like new business, and certainly not an unsuccessful interview.

Mr. Cooper should give his article a new title, and head it "The Value of Hoarding Up, etc." It appears to me that if the cards are not worth keeping, they are not worth the time spent in making them out, and so much time wasted and unnecessary. If this be the general idea, why not let the contract officer make out his report of interview only, keeping a diary for appointments. Personally, I think the cards are of some value, and would certainly vote in favour of keeping them until some better scheme can be adopted or suggested.

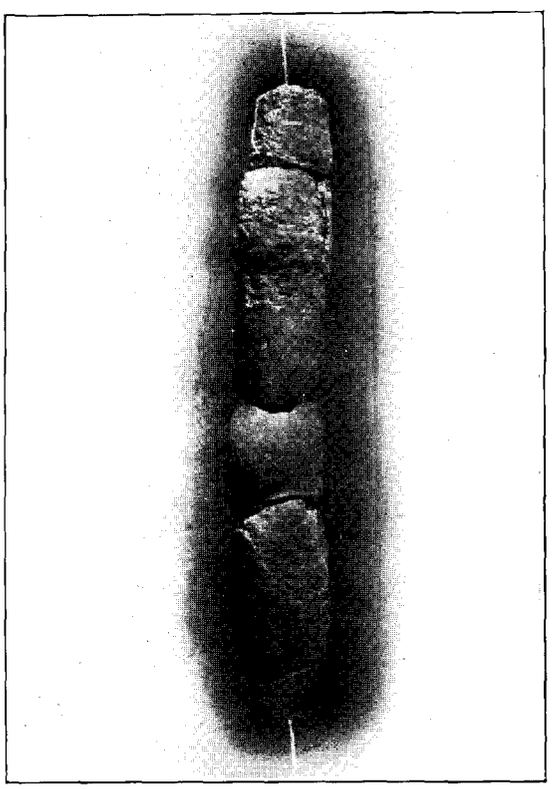
One remark in Mr. Cooper's letter must not be passed unnoticed. I refer to the sentence, "or if competition exists when, of course, orders must be obtained with little regard to cost," in latter part of paragraph 6. This implies that where competition exists, we are favoured by not having to study the percentage of expenses to revenue obtained. If Mr. Cooper will consult his return of contract officers' results, he will see that competitive compare very favourably with non-competitive areas.

Hull. GEO. W. CAMPBELL.

WIRES COATED WITH CEMENT.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

THE accompanying illustration which may be of interest to readers of the JOURNAL is a photograph taken from a sample of 1/18 bronze wire recently cut down at a cement works in Northfleet. It is a common sight to see wires in this neighbourhood coated with cement, bearing the appearance of rope, and varying in size from a quarter of an inch to 3 inches thick owing to the accumulation of cement; but the exceptional character of the wire in the photograph was due to its being a short distance from the front of several



boilers, the heat from which caused the cement to harden until the wire broke down owing to the weight. There were no deteriorating effects upon the wire itself.

The photograph shows an accumulation of about four months. The length of the span was 50 yards, and the wire was coated as in the photograph for a length of about 15 yards, and then became thinner towards the bracket attachment. The sample shown is 20 inches in length, weighs 3½ lbs., and is 11 inches in circumference at the thickest parts.

W. CLARKE,

6-8, Marshalsea Road, April 30. Local Engineer, Woolwich.

TEAM WORKING.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

REPLYING to Mr. W. Duff Stewart's letter in the June issue of the JOURNAL, while we are not desirous of unduly lengthening the controversy, we must say that we fail to see that he has strengthened his case or weakened ours. We may at once confess that we know little of logic or the art of war. We have not studied Aristotle, Mill or Bosanquet, but nevertheless our principles are arrived at inductively, *i.e.*, they are suggested by an examination of instances.

We not understand that in battle each regiment strives to reach the enemy first, for in that case no regiment would be likely to reach the enemy at all, but each tries to do its duty best and to show the greatest pluck and endurance, and each is aided in that way by the knowledge that there is competition even in the time of battle, and *esprit de corps* helps more at such a time than even love of country.

We admit that the football team was an "impossible" simile; for in football, team is opposed to team; but the simile was not ours!

As for a boat race, men do not row races day by day for their living; but apart from that, the idea that one crew does not help another is surprising. Has Mr. Stewart never heard of "pacemakers?" What would be the pace of a crew

that never rowed a race? and how many would take up this class of sport if there were no competition? Where would our crews be, and what would be their speed and style when opposed to those of other countries if they practised at home against time? even supposing a curve had been carefully prepared for each class of boat! No, no; Mr. Stewart must take human nature as it is, not as he would have it. What higher ideal is there than that of socialism? but is socialism practical? and does the man who is not a socialist show want of proper spirit?

We prefer to have our interest centred, first in our divisions, then in the exchange; should we be also blamed for having other interests centred, first in our homes, then in our city? Will not even a man do more for his home than for his city? and *we* are only women!

We must repeat that the comparison between exchanges is no comparison, because the conditions are totally different even when the plant used is similar.

It would, perhaps, be repeating a platitude to say that a telephone operator's work is a speciality in itself. The particular aspect of this that we want to illustrate is that however much may be done by the staff in the aggregate, there is nothing to show the work of the individual. This lends itself to a certain kind of abuse which we as operators are only too well conversant with; for on the same principle of an average statistical figure covering extremes either way, so does the average service given by an operating staff of any large exchange cover individual failures. It is impossible to obtain an individually exact level of industry in any body of persons. The same reasoning will apply to a body of telephone operators; there must be some who do not carry a fair proportion of the daily load, but this laxity is covered largely by the extra work demanded, and so often given, by the remaining operators. A continuance of this has, in time, a depressing and discouraging effect on the energetic staff, and we maintain that under the system of "one exchange one team" a certain looseness of this kind may occur, with the chances much against its location.

By subdivision of the staff into teams, each with its senior captain, we can at once localise the strong and weak members of the staff. The captains have each member of their teams under their personal supervision, the natural consequence being that all weaker members receive special training and they very soon "mend" or "end" their ways. Our experience has always been "mend." The result is an improved service and the total extinction of the "inefficient" operator.

This subdivision has added much responsibility to our positions as seniors, but we welcome this for we now feel that we are living links in the chain of our exchange organisation, and not merely registering machines. We have our monthly meetings with the exchange management officials when we discuss the previous month's service and go into all matters pertaining to traffic and operating, particularly suggestions from our operators with regard to any difficulties or handicaps; all new instructions are explained to us and we enter into the spirit of the work and transmit the knowledge received to the members of our respective teams.

As on the one hand the order of a man's interest is his home, his city, his country, on the other hand ours is our teams, our exchange, our Company.

We are sufficiently good sportswomen to feel that friendly rivalry is the best incentive to comradeship, mutual trust and good work. Had Mr. Stewart operated for twelve months and then read again the last paragraph of our previous letter he would understand that we meant what we said, for we wrote from experience.

E. E. FITZGIBBON.
E. E. SHORT.
F. MANNING.

THE CORRESPONDENCE CLASSES.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

THE committee of the classes would like to thank Mr. Brassington for his letter in your April issue pointing out what he thinks to be weak spots in some of the class matter. There have undoubtedly been some errors, and while the committee cannot hope for perfection in the issue of matter of this sort, they are most anxious to approximate it as closely as is possible. Additional precautions are being taken in the endeavour to prevent the recurrence of any troubles, but it must not be overlooked that the issue of a large quantity of matter such as that in question, including as it does so much mathematical work, can scarcely ever be made without a certain percentage of error.

In the case of many standard text books it is quite common to find a quantity of errors—some formulæ set out wrongly and some answers to questions given wrongly, etc.—their presence sometimes notified by an *errata* slip and sometimes not. I do not instance this fact to justify mistakes in the Correspondence Class books, but merely to show that in matter of this sort it is well nigh impossible to be absolutely free from error.

The committee always welcome criticism which tends to the improvement of the class work.

P. H. C. PRENTICE,
For the Correspondence Class Committee.

June 23.

STAFF GATHERINGS AND SPORTS.

Bristol.—An outing of the Bristol staff took place on Saturday, June 12, when a party consisting chiefly of district office staff and operators journeyed to Tintern and Chepstow, exploring the scenery of the beautiful Wye Valley in that district. The party left Bristol in a saloon attached to the afternoon train to Tintern and then visited the Abbey, where brakes were waiting and conveyed them over the Wyndcliffe. A pause was made to visit the summit of the hill and the woods, and afterwards the journey was continued to Chepstow, where tea was served. The visit to the Chepstow Castle was also much enjoyed, and this completed the outing, and the train was rejoined at Chepstow for the return to Bristol. The weather was good, and all who participated expressed their delight in being able to take part.

Leeds.—Under the auspices of the telephone society, a party of about 25 members and friends enjoyed a ramble in the country on Saturday, May 22. Train was taken to Garforth, then (by kind permission of Mr. Prater) the party walked through Col. Gascoigne's estate, *via* Parlington Woods to Aberford, and thence to Barwick-in-Elmet, where tea was taken. After tea, the party was conducted by Mr. Eaton (the father of one of the Leeds operators) over an old British fortification which it is said was constructed in the pre-Roman period. The party then walked on to Scholes and there took train for Leeds, thus concluding a very enjoyable outing.

Portsmouth.—The Portsmouth operators have formed a tennis club, and are fortunate in securing a court on the fine lawns attached to the Corporation canoe lake grounds. The name of the club is the "Golliwogs," and was probably suggested by the appearance of several members after the first game.

London.—Much interest was shown in a cricket match which took place at Battersea Park on Monday June 14, between the night operators of the General Post Office and those of the National Telephone Company, resulting in a win for the latter by 72 runs, the scores being: General Post Office, 40; National Telephone Company, 122. Good feeling was shown on both sides, and a very enjoyable afternoon was concluded with a musical tea at the pavilion.

NEWS OF THE STAFF.

AN exchange of local managerships has been made between Maidenhead and Bedford, Mr. F. LANGDON-DAVIES, Local Manager, Bedford, becoming Local Manager of Maidenhead, and Mr. T. C. RHODES becoming Local Manager of Bedford.

Mr. F. G. C. COLEMAN, Clerk, Oxford, has been appointed Contract Officer, vice Mr. H. P. NICHOLLS resigned.

Mr. J. H. BIGLAND, Divisional Contract Agent, Gerrard (London), appointed Divisional Contract Agent, City, vice Mr. J. F. GUEST, resigned.

Mr. C. H. BRANDRETH, Private Branch Exchange Officer, Contract Manager's Office, appointed Divisional Contract Agent, Gerrard (London).

Mr. C. BURROWS, Clerk, Metropolitan electrician's office, appointed Fault Clerk, London Wall.

Mr. A. J. COHEN, Inspector, Salisbury House (London), appointed Clerk of the Works on Engineer-in-Chief's switchboard staff.

Mr. D. HUTCHINSON, Assistant Engineer, Brixton, appointed Assistant Engineer on London Study.

Mr. H. SHARMAN, Faultfinder, appointed Faultfinders' Overseer, North-East District, London.

Mr. H. G. PECK, Metropolitan construction staff, appointed Exchange Electrician, East.

Mr. R. C. WILSON, Clerk, statistical office, appointed to Metropolitan Engineer's office.

Mr. A. WILSON, Chief Inspector, Greenock, has been appointed Electrician for the district, and Mr. A. BUCKLITSCH succeeds Mr. Wilson as Chief Inspector for Greenock centre.

Mr. JOHN M. GRAHAM, Edinburgh district, has been promoted from Switchroom Inspector to be Assistant Electrician.

Mr. R. B. RAE, Edinburgh, has been promoted from Engineer's Clerk to be an Assistant Engineer.

Messrs. J. L. LEES, THOS. J. COLLINS and W. H. TAYLOR, of the Portsmouth Electrical Department, have secured second-class certificates for telephony in the recent City and Guilds examination held at Portsmouth.

Miss EDITH BOURNE, Operator, Hastings Exchange, has been transferred to Eastbourne in a similar capacity, and on leaving the former centre was presented by the staff with a writing case as a token of esteem.

Mr. W. F. SWAIN, District Office Clerk, was presented with a watch by the Brighton staff on the occasion of his transfer to Manchester. The presentation was made by Mr. L. Parsons, Chief Clerk.

Mr. F. LITTLE, District Office Clerk, was presented by the Brighton staff with a watch on his removal to Warrington, Mr. C. F. Moorhouse, District Manager, performing the ceremony.

Miss ALMA M. FLUX, Clerk-in-Charge, Cardiff, resigned her position in the Company's service on May 27, 1909. Miss Flux completed ten years' service with the Company in March last, during which period she carried out her duties in an exceptionally able manner, having had to contend with very keen competition during a greater part of the time. It is greatly to be regretted that during the past two or three years her health has been so unsatisfactory, and largely on this account she has felt compelled to resign her position in order to have a complete rest and change. The District Manager on behalf of the chief officers and operating staff of the Cardiff centre presented her with a solid gold watch bracelet, inscribed with her monogram and the date of presentation, as a mark of respect and esteem in which she was held by all, and with the sincerest wishes for future health.

Mr. E. A. GREGORY, Local Manager, Keighley, has been transferred to Durham centre, and on leaving was presented by his colleagues with a gold-mounted umbrella.

Mr. F. BASTOW, Chief Inspector, Keighley, has been transferred to Bradford as Chief Test Clerk. On leaving Keighley, where he has been extremely popular, he was presented with a timepiece and a pair of bronzes subscribed for by all grades of the staff.

Mr. A. SPEIGHT, Chief Fitter, Bradford, has been transferred to Keighley as Chief Inspector.

Miss E. E. FITZGIBBONS, Senior Operator, Bristol, has been promoted to be Travelling Supervisor for the Bristol district.

Miss A. M. EVANS, Senior Operator, Bristol Exchange, resigned on account of ill-health. Before leaving she was presented by the Traffic Manager on behalf of the staff with a handsome gold signet ring.

Mr. H. P. NICHOLLS, Contract Officer, Oxford, was presented on June 5 with a silver cigarette case by the local staff on leaving the Company's service to take up a position with the Mile End Distillery Company.

London Traffic Department.—*Promotions and Transfers:*

Miss ELIZABETH CRAVEN, Operator, Avenue, has been promoted to be Supervisor, Holborn.

Miss LILIAN TURNBULL, Operator, London Wall, has been promoted to be Supervisor, Avenue.

Miss ROSE MITCHENER, Operator, North, has been promoted to be Supervisor, London Wall.

Miss JEANIE YULE, Supervisor, Holborn, has been transferred to Paddington.

Miss ROSE HILL who was shown in the June number as being promoted to be Supervisor at London Wall, should have been shown as Supervisor transferred to London Wall.

Miss MARGARET BOOTH, Supervisor, Avenue, was presented with a gold locket by the staff on being promoted to be Supervisor-in-Charge at Lee Green.

MARRIAGES.

Miss ANNIE GIBSON, Senior Operator, Selkirk, left the Company's service on June 11 after seventeen years' service to be married, and was presented by the Border staff with a handsome china tea service. Mr. H. G. McFarlane (District Manager) made the presentation and expressed the good wishes of the staff. Miss Gibson was also the recipient of a cheque value £28 from the Selkirk subscribers.

Mr. C. F. KNIGHT, Statistics Department, General Superintendent's office, was married at Faversham on June 21 to Miss Katherine M. Burden. He was presented by his colleagues in the General Superintendent's office with a Gladstone bag.

Miss MARY MCNAUGHT, Senior Operator, Gorbals Exchange, Glasgow, left the Company's service on May 27 to be married. She was presented with a clock and butter dish by the staff, who expressed every good wish for her future happiness.

Miss HELENOR MCGINLAY, Senior Operator, Argyle Exchange Glasgow, resigned on June 3 to be married. Before leaving she was presented with a silver cake basket by the staff in her exchange.

Miss VIOLET SMITH, Senior Operator, Hillhead Exchange, Glasgow, resigned on May 28 to be married. She was presented with a case containing silver-backed mirror, brush and comb, and with a pair of crystal salt cellars.

Miss DOROTHY ELLIS, Senior Operator, Hillhead Exchange, Glasgow, resigned on May 13 to be married. The staff presented her with a dinner service and set of Spode-ware jugs.

Miss LILIAN E. JONES, Senior Operator, Bootle Exchange, resigned her position in the service on May 27 in view of her approaching marriage. Before leaving Mr. Roberts, the Local Manager, presented her with a handsome dinner service subscribed for by the staff in the north division of Liverpool.

Miss M. OWEN, Senior Operator, Royal Exchange, Liverpool, resigned on May 20, prior to her sailing for Ontario, where she will be married. Before leaving she was presented with an electro-plated sugar basin and cream jug by the operating staff, and with various other gifts from individual members of the staff.

Miss BEATRICE KITCHEN, Senior Operator, Portsmouth, who left the service on May 28 to be married, was presented by the staff with a dinner service and salad bowl.

Mr. ARTHUR LEE MANTLE, Automatic Box Inspector, Nottingham, was married to Miss NELLIE MARY ROSE, late Cashier, Nottingham district office, at the picturesque county church at Colwick, near Nottingham, on June 7. He was presented with a dinner service by the members of the Nottingham district office and local staffs.

Miss VIOLET FALLAS, Senior Operator, Sheffield, resigned her position on June 17, in view of her approaching marriage. She was presented by the operators with a cake stand.

London Traffic Department.—*Resigning to be Married:*

Miss C. THOMPSON, on resigning from Gerrard to be married, was presented with a tea service by the staff.

Miss NORA NICOL, Operator at Dalston, on resigning her appointment to be married, was presented by her colleagues with a silver cake basket.

Miss MAUD MURRAY, Senior Operator, Avenue, was presented with a salad bowl and servers on leaving the service to be married.

Miss GERTRUDE WORLEY, Operator, Avenue, has resigned in view of her approaching marriage. She was presented with an egg-stand by her colleagues.

Miss EVA SHERBURN, Supervisor, Avenue, was presented with a flower stand and a jam dish on resigning to be married.

Miss ALICE TEBBUTT, Senior Operator, Battersea Exchange, left on June 17 to be married. She was presented by her friends amongst the staff with a china tea service.

OBITUARY.

We regret to record that Mr. THOMAS ROWE, who was until lately District Engineer, Liverpool, died at the age of 70 on June 5. A biographical notice of Mr. Rowe appeared in the April, 1907, issue of the JOURNAL. Mr. Rowe retired on pension in 1906, after 25 years' service with the Company.

We have also to record the death of First-Class Wireman THOS. WYATT, of Bradford, who died on June 18 from cancer on the liver, after service in the Company for a period of twelve years. The outside staff sent a wreath as an outward mark of their sympathy.

On June 4, Mr. BERNARD MCMAHON, Inspector, of Newport, Mon, died of acute pneumonia at the residence of his mother-in-law, at Bristol. He entered the Company's service at Glasgow in 1892, and, prior to being transferred to Newport, had also served at Southampton and Hastings. The case is rendered additionally sad by the fact that his wife pre-deceased him only by a short time. He leaves two children.

We regret to report the death of Miss ELSIE DURDEN, who resigned her position as an Operator at Richmond in April last on account of ill-health. She underwent a severe operation for goitre at the University College Hospital, on June 14, but died the next morning. She was an excellent and willing operator and her personal qualities made her very popular with all those with whom she came into contact.

LOCAL TELEPHONE SOCIETIES.

Luton.—The election of officers for the 1909-10 session resulted as follows: President and chairman, Mr. H. J. Wilson; committee, Miss Stratford, Miss Sale, Messrs. Cain, Smith, Raines and Parr; secretary, Mr. G. F. Beck; treasurer, Miss E. E. Whitmore.

Nottingham.—This society held their annual meeting on April 23, 1909. The following officers were elected for session 1909-10: President, A. Coleman, Esq.; vice-presidents, J. Scott, Esq., C. H. Sibley, Esq.; committee, Miss Tait, Messrs. J. T. Cooke, E. Earp, W. S. Haimes, T. Justin, A. C. Morris and H. Saywell; hon. secretary and treasurer, Mr. M. B. Oldbury.

AN ECHO OF THE OFFICERS' MEETING.

A CORRESPONDENT, along with the suggestion that many of the officers who were unable to obtain a hearing on the "Traffic" question at the meeting in May last might profitably express their views in the columns of the JOURNAL, sends us the following verses:—

On the twentieth day of the month of May
I was watching the busy throng
In the street that is known by the name of "Fleet,"
As they rushed absorbed along.

There were men intent on business bent
And some who had nought to do;
But they all seemed mad to get to the end
Of whatever they had in view.

As they neared the corner of Bouverie Street
Their course had a slight set back,
For a block sent some to the port side there
And the rest took the starboard tack.

And I noticed a voluble corner group,
And an argument held these men;
And a 12-inch gun would have only been fun
Had it dropped a projectile then.

There were men in that group with a scholarly stoop,
With flashing eyes and keen,
Whose faces were lit and whose brows were knit
By the subject discussed between.

Little they cared that pedestrians glared
As they swung to the left or right,
I saw that, although it was 1 p.m.,
They might well go on till night.

There was one who would prove that *his* view was right,
Another showed where *he* was wrong,
Regardless of taxies, policemen or heat,
And blind to the hustling throng.

It was not a raid on a betting club
Or a "Rush up" of Kaffir stock;
No Dreadnought was rammed by a German boa
No Liner was on a rock.

'Twas only a few keen-eyed Traffic men
Discussing their favourite theme;
Was it correct to work as a whole
Or should we continue the "team?"

They had just left the meeting at Hamilton House
For lunch or, at least, fresh air;
But no one seemed anxious to eat or carouse,
They were holding an inquest there.

I watched them till hunger compelled me to seek
A Lyons or A B C;
And as I discussed my bath bun and milk,
I thought what a good thing 'twould be

If in the JOURNAL a page could be kept,
For the use of the subject alone,
To be headed "Notes by the Traffic Adept,"
To show how the work should be done.

For most of us gathered that during the day
The half was not told that was known,
The three-minute gong closured most of the "say"
And "Lamb" was not "Cornered" alone.—S. J. P.

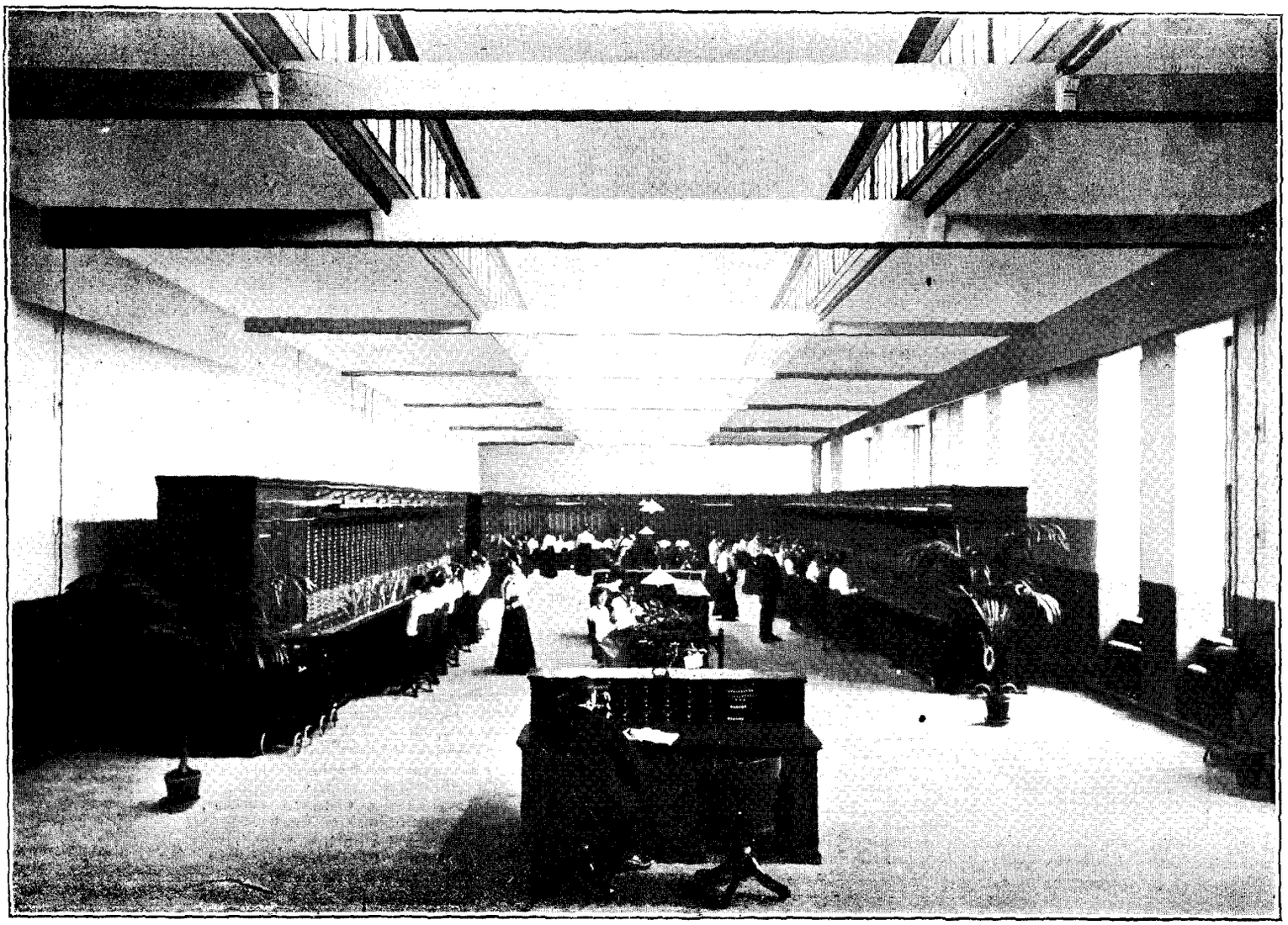
[The Editor will be glad to consider any papers on "Traffic" questions which may be submitted, and to publish such as are suitable.]

EDINBURGH CLASSES.

THE following results obtained by the members of the Edinburgh staff who attended classes during the past winter are noteworthy:—

At Heriot Watt College.—Medallist in physiology, A. McNab, Draughtsman; First-class certificate, honours grade telephony, R. B. Rae, D. McIntosh, Engineer, S. R. McKenna, Foreman Jointer; Second-class certificate, honours grade telephony, J. A. Matheson, Fitter; Second-class certificate, ordinary grade telephony, J. Crear, Test Clerk, G. Colquhoun, Mechanic; Prizeman in practice of commerce, T. Crawford, District Office.

At Continuation Classes.—First prizeman in English, W. Bradley, District Office; First-class certificate in mathematics, W. Bradley, District Office; Speed certificate in shorthand (60 words), Mary N. Munro, District Office; Certificate in typewriting, Mary N. Munro, District Office; First-class certificate in commercial arithmetic, R. Bennyman, District Office.



HILLHEAD EXCHANGE, GLASGOW.

INTIMATION of the opening of this new central battery exchange was given in the May issue of the JOURNAL, and it is hoped the following views may be of interest to members of the staff in other districts and other readers of the JOURNAL :—

The exchange serves the districts of Hillhead, Kelvinside, Dowanhill, Partick, Partickhill, Jordanhill, Whiteinch, Scotstoun and Scotstounhill, and has been planned to accommodate 10,000 subscribers.

Fig. 1 shows the exchange, which is located in premises at the west corner of Caledon Street and Highburgh Road, Dowanhill. These are built of red and white sandstone, and this combination and the building's other architectural features gives it a commanding appearance and makes it an outstanding feature in the district. The exchange premises are situate on the first and second floor fronting Caledon Street. The ground floor fronting Caledon Street and that part of the building fronting Highburgh Road is being let as first-class residential flats.

Fig. 2 gives a view of a corner of the roof, which is a flat one, and on which has been established a roof garden for the benefit of the operating staff. Needless to say the whole staff are much delighted with their new surroundings and with the arrangements for their comfort and accommodation.

Views of the other parts of the premises have not been given, as these follow generally the same lines as in other up-to-date exchanges, illustrations of which have at various times appeared in the JOURNAL.

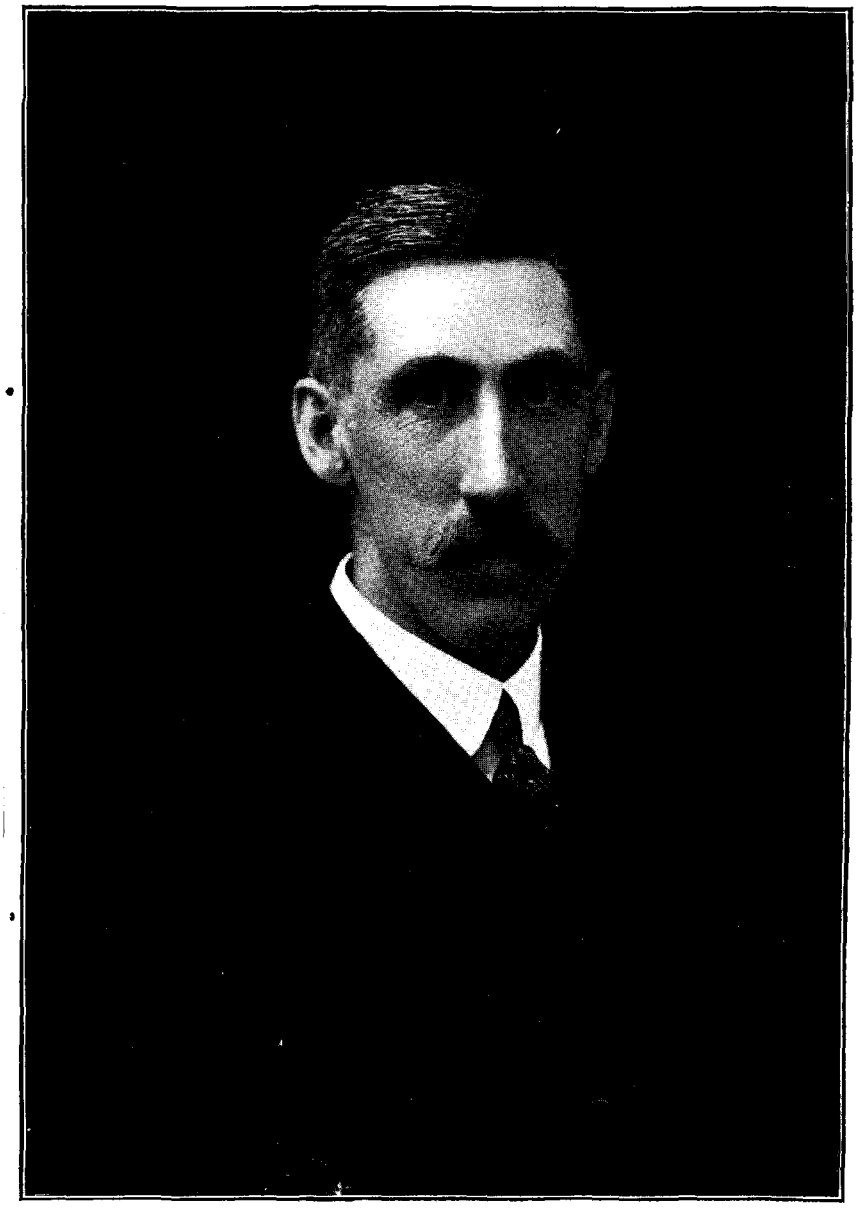
THE
National Telephone Journal

VOL. IV. AUGUST, 1909. No. 41

TELEPHONE MEN.

XXXIX.—FRANK GILL.

FRANK GILL was born on Oct. 4, 1866, at Castletown, Isle of Man, being the youngest son of Henry Corlett Gill, advocate of that town. As a boy he was delicate and diverted from the public school for which he was intended to private schools at the Isle of Man and at Southport.



[*Photograph by Dover Street Studios.*

On Oct. 8, 1882, he entered the service of the United Telephone Company, London, and, after an absence of some months owing to an unfortunate illness, re-started telephone work with the Telephone Company of Ireland as an instrument inspector. He subsequently became Electrician to that company and stayed in Dublin till 1890. Besides instrument work Mr. Gill had to do repairs and additions to exchange plant, and also to take evening and Sunday operating.

The company was not a rich one, and was unable to proceed with the projected installation of a multiple equipment, but the electrical staff were none the less keen and enthusiastic for this reason. The line plant used at that time was 3/16 iron, and, with dry joints, had a habit of allowing the voice to fade gradually away until restored by a coherer action, not then understood, caused by tapping the transmitter.

Owing to political reasons, Ireland lagged much behind Great Britain in technical education in those days, but Mr. Gill succeeded in attending lectures and laboratory work at the Royal College of Science, under Professor Barrett, and lectures at the City of Dublin Technical School.

In March, 1890, he was appointed Electrician to the Liverpool district, and besides having the control of a large staff—a new experience—he had to handle many problems which required to be dealt with locally. The exchange equipment then in use at Liverpool was the original first multiple installed in Europe, and to meet extensions it was decided to fit an independent multiple in the same room. It was on these equipments in 1891 that the first set of automatic junction clearing signals in this country was fitted. These signals were like galvanometer needles, ten on a strip, and were deflected so long as the line was engaged, returning to zero when cleared by the "A" operator. Prior to that, and even long after, it was the custom for the operator to go on the call wire and order the subscriber's line to be disconnected. Line cost being of no moment in this case, separate signalling circuits were used and no attempt was made to signal over the talking circuits. There was, of course, a marked improvement in the ease with which calls were handled over these circuits as compared with other junctions. As the primary cells for these signals gave trouble, storage cells were fitted, fed by gravity Daniell cells in parallel, there being no power supply available, and these worked well. About this time Mr. Gill made two time checks, operated by electro-magnetic clutches, and they were used for some time on the London-Liverpool trunks with success.

Besides designing and building a number of equipments, he was responsible for the specification and erection of the Liverpool equipment for 3,300 subscribers' lines, opened April 1, 1893, one of the very early metallic-circuit switchboards in the country. Desiring to use storage cells for the operators' transmitters, Mr. Gill found that if even a very small part of the circuits of two instruments were common, cross talk

resulted, and consequently all leads were carried back to the cells. This equipment was the first in this country on which storage cells fed from the mains were regularly employed, and in this connection the difficulty of obtaining satisfactory small fuses gave a good deal of work. Flame-proof cable and ringing machines with electro magnets were also first employed on this equipment. A considerable amount of work was done about this time in connection with duplex circuits. Tests were made upon the efficiency of the first dry-core cable in this country and much time was consumed upon the anomalies of the alleged K. R. law.

In May, 1893, Mr. Gill was appointed District Manager for the area now included in the districts of Blackburn and Preston. This appointment lasted only nine weeks, for in July, on the purchase of the Telephone Company of Ireland, he was appointed District Manager for Dublin and the South of Ireland.

In February, 1896, Mr. Gill was appointed Superintendent for Ireland. During his superintendency underground work at Dublin, Belfast, Cork and Limerick was started, and in the first two places sites were procured and specially constructed buildings were put up.

In July, 1903, on the retirement of Mr. Sinclair, he was appointed Engineer-in-Chief to the Company. It is from this date that his individuality and energy began to impress themselves not only on the undertakings of the Company, but to an equal degree on the Company's staff. He insisted on a more exact method of considering telephone problems than the older generation of telephone men had been wont to make use of, and this exactness has permeated the Company's staff to the advantage of Company and subscriber alike. Mr. Gill, whilst introducing changes of far-reaching effect, has had the tact to obtain and retain the confidence and esteem of the Directors and the staff of the Company; and those of his colleagues with whom he is brought more closely into touch much appreciate the ability and clear power of thought which he is always willing to give to any question on which they consult him.

Outside the Company Mr. Gill is recognised as an authority on telephone engineering, both by the British Post Office and by telephone men throughout the world. He was elected an associate of the Institution of Electrical Engineers in 1891 and a member in 1898. He was hon. secretary to the Dublin local section of the Institution from its inception in December, 1899, to July, 1902. He served on the council of the Institution from 1903 to 1906 as ordinary member, and from 1906 to 1909 as a vice-president, retiring from the council after the expiry of the full term. He is an associate of the American Institute of Electrical Engineers, a member of the Engineering Standards Sub-Committees on Telegraph and Telephones and on Cast-Iron Pipes for Electrical Purposes. He is also a trustee of the Staff Pension Fund and of the Compensation Fund.

In 1895 he married a daughter of Mr. C. W. Beckwith, advocate, of the Isle of Man.

Mr. Gill is a strong supporter of the local telephone societies and has done much towards their success, believing them to be a useful step in the direction of higher education.

Mr. Gill plays golf. What this involves all those who do not play will appreciate!

BELFAST TELEPHONY CLASS.

A TELEPHONY class was established during the session for 1908 and 1909, under the tutorship of Mr. A. R. Pulford, Chief Inspector, National Telephone Company, Belfast district, at the Municipal Technical Institute. The examination has resulted in the following certificates being obtained:—

J. F. McDonald, second class.
S. W. McDougall, ,, ,,
R. Christie, ,, ,,

Mr. W. H. Sloan was also successful in obtaining a first-class certificate in the examination for wiremen's work, and Mr. W. S. Keown a second-class certificate in telegraphy.

APPRECIATION OF THE MEASURED RATES.

A BRADFORD firm of stock and share brokers have written the Company voluntarily that they are pleased to bear testimony to the value of the measured rate system of working as against the flat rate system. They state that the extra cost is fully met in the advantage gained by the operators taking over the responsibility of notifying them when the line engaged is at liberty. They state that prior to adopting the measured service a good deal of their typist's time was taken up in persistently having to ask the exchange for subscribers who were engaged, a difficulty which now is entirely obviated.

SOME CONSIDERATIONS IN THE MANIPULATION OF DRY-CORE TELEPHONE CABLES.*

BY F. G. C. BALDWIN, A.M.I.E.E., *Engineer, Birmingham.*

THE object of this paper is to present, as briefly as possible, some of the more important considerations occurring in actual telephone practice, to describe the various operations which a telephone cable undergoes after its manufacture, and to endeavour to illustrate what is done by the National Telephone Company to secure the greatest working efficiency. A few of the chief appliances and fittings used in connection with these cables will also be described.

The superiority of the dry-core, air space, or paper-core cable is now universally accepted, and its advantages being well known, they need not be further commented upon.

It is agreed that the "*duct*" or "*conduit*" system of installation best facilitates repairs, renewals, inspections, etc., which is not the case with the solid system. The duct system only, therefore, will be considered, and the remarks which follow refer chiefly to the type of metallic circuit table used for subscribers' lines and short local circuits.

A description of the constructional features of dry-core cables is unnecessary, as they are generally known. Table I, which has been extracted from the National Telephone Company's specification for dry-core cables with 10-lb. conductors, gives details of the number of pairs in the core and several layers. One or more "marked pairs" are usually provided in each layer.

The methods of laying cables are well known to electrical engineers, and therefore need no detailed description. Owing to the loose way in which the wires of dry-core cables are disposed inside the lead sheath, extreme care is essential in handling so that injury to the lead sheath may be avoided.

The various methods adopted in drawing cables into ducts are as follows:—

1. *Directly by Hand.*—Hand hauling is restricted to short lengths of small cables.

2. *By Means of Pulley Blocks and Chain or Rope Tackle.*—Used in special cases only.

3. *By Means of a Manually Operated Winch.*—This method is most commonly used, and has proved its superiority for general work.

4. *By Means of a Power-driven Winch.*—As far as is known to the author, no power agent has been adopted in this country which is more economical than the manually operated winch.

Opinions differ as to whether a rope or a chain is the best for hauling. The difference in prime cost is negligible. For large and heavy cables a 4½-inch rope is usually used.

The attachment of the cable to the rope or chain is a matter of considerable importance. For this purpose a wire "grip" has been universally adopted, which avoids mutilation and consequent scrapping of the cable end. The grip consists of a woven cylinder of steel wire, interlaced in such a manner that contraction ensues upon the application of tension. In use it is simply slipped over the end of the cable, and tightens up when hauling is commenced. Some preliminary preparation of the end of the cable is necessary, and in some cases where heavy lengths are being dealt with it is advisable to open the end of the cable, and, laying bare the conductors for a few inches, to plumb them solid with the lead sheath. This ensures the tension being equally distributed amongst the conductors, and avoids the possibility of the lead sheath parting. A lubricant in the form of petroleum jelly is usually applied to the cable as it enters the duct. The speed of travel of cables varies from about 3 feet to 8 feet per minute. By judicious arrangement it is in many cases possible to deal with cables of small diameter (not exceeding 1½ inches) without cutting or jointing in the maximum lengths in which they can conveniently be manufactured. The cable is first drawn in from a point intermediate between the

* Abstract of paper read before the Birmingham Section of the Institution of Electrical Engineers, April 21, 1909. We are indebted to the Institution for permission to reproduce the blocks.

two extremities of the section—where a break in the conduit line exists—to one end of the section in the ordinary way, after which the remainder is flaked off the drum and laid upon the ground in the form of a figure 8. The free end is then attached to the rope, and hauling proceeds in the opposite direction until the whole has been laid. Lengths of nearly 800 yards have been successfully dealt with in this way and the cost of a joint saved.

TABLE I.

Dry-Core Telephone Cables (with 10-lb. conductors).

Number of conductors.	Number of pairs in the several layers.													
	Centre.	1st.	2nd.	3rd.	4th.	5th.	6th.	7th.	8th.	9th.	10th.	11th.	12th.	13th.
Pairs.														
5	1	4	...	...	...	...	...	...	...	...	...	...	...	...
8	1	7	...	...	...	...	...	...	...	...	...	...	...	...
10	2	8	...	...	...	...	...	...	...	...	...	...	...	...
15	5	10	...	...	...	...	...	...	...	...	...	...	...	...
20	2	6	12	...	...	...	...	...	...	...	...	...	...	...
25	3	9	13	...	...	...	...	...	...	...	...	...	...	...
50	4	10	16	20	...	...	...	...	...	...	...	...	...	...
75	4	10	15	20	26	...	...	...	...	...	...	...	...	...
100	3	9	13	19	25	31	...	...	...	...	...	...	...	...
150	4	10	16	21	27	33	39	...	...	...	...	...	...	...
200	4	10	16	22	28	34	40	46	...	...	...	...	...	...
250	4	10	16	21	27	34	40	46	52	...	...	...	...	...
300	3	9	14	20	26	32	38	46	52	60	...	...	...	...
400	1	6	12	18	24	30	36	42	48	55	61	67	...	...
500	2	8	14	20	26	32	38	45	51	57	63	69	75	...
600	4	10	16	22	28	34	40	46	52	58	64	70	75	81

Any extra pairs to be put in the outer layer.

During jointing and its attendant operations precautions are taken to secure the following:—

1. Minimum number of faulty circuits in the completed cable.
2. Immunity from crossed pairs.
3. Lead sheath perfectly air and water proof.
4. Electrical properties up to the standard.

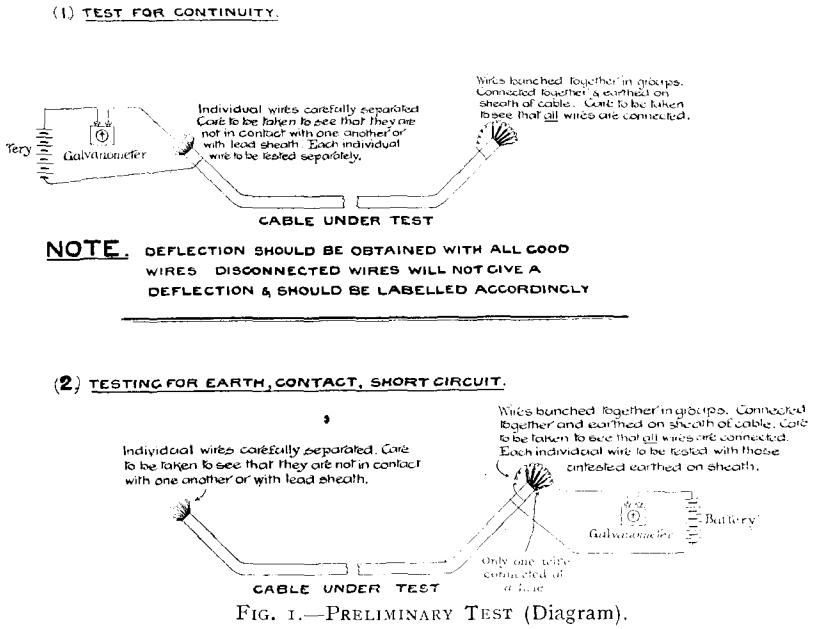


FIG. 1.—PRELIMINARY TEST (Diagram).

Preliminary Test.—Each length of cable after being laid is subjected to a preliminary test as a primary indication of the existence of faulty wires, which, if found to occur in more than one length, should be jointed together. The number of faulty circuits in the completed cable should then be a minimum. The test is reliably made in the manner indicated by the diagram (Fig. 1), which is self-explanatory.

1. Test for continuity.
2. Test for earth, contact and short circuit.

After the test has been carried out all faults should be verified and faulty wires labelled.

Jointing.—In jointing especially is it necessary to observe cleanliness and to exclude moisture. In large joints where the core is exposed for a period of twenty hours or more the moisture absorbed by the dielectric from an atmosphere of varying humidity may be considerable unless proper precautions are taken. While jointing is progressing heat is applied either constantly or at frequent intervals to expel moisture. After the lead has been stripped off for the requisite distance jointing is performed as indicated in Fig. 2.

(*a*) For conductors under 70 lbs. per mile the wires are tightly twisted together as shown, and insulated by a dry paper sleeve.

(*b*) Conductors of 70 lbs. per mile and over are similarly twisted, but are insulated by their paper covering, reserved for the purpose, and secured as illustrated by a binding of cotton thread.

In both cases the paper is included in the first two twists to prevent it running back, and the joint is not soldered.

Wires of respective colours should be jointed together. The sleeved or paper-insulated joints should be distributed to secure uniform diameter of completed joint, and the wires should be only

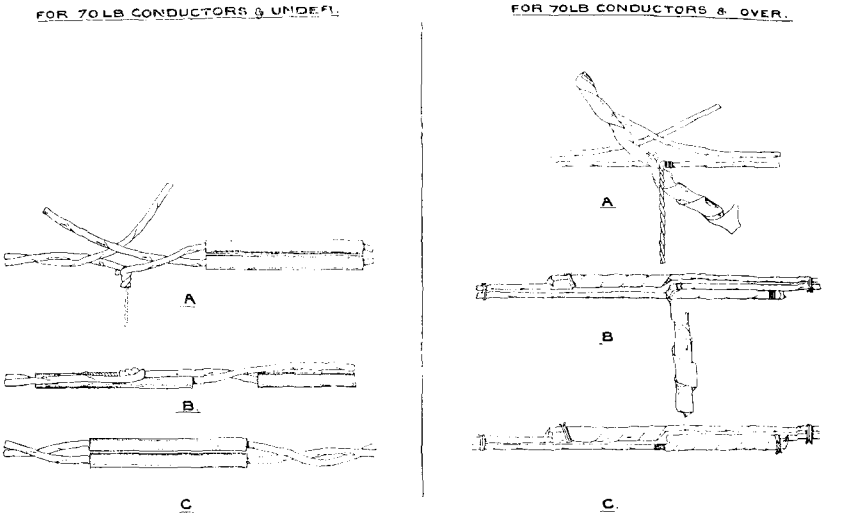


FIG. 2.—DETAILS OF JOINTING.

(*a*) For 70-lb. conductors and under. (*b*) For 70-lb. conductors and over.

moderately taut. After a thorough drying the joint is served with a binding of dry cotton tape without overlap, and immediately afterwards the plumbing is executed, 6-lb. sheet lead, or preferably an unseamed sleeve, being used. A brass nozzle with screwed cap and leather washer is permanently plumbed into the sleeve, and by connection thereto of a flexible tube air, dried by passage through a small portable desiccator, is forced into the joint by means of a hand pump. A defect in the plumbing is shown by the continued appearance of air bubbles on the application of soapy water.

The introduction of crosses is guarded against by proving each pair as jointed. Before commencing the first joint the extreme end of the first length of cable is opened, the individual pairs are very carefully selected, and the (*a*) and (*b*) wires of each are connected together and insulated. The continuity of each pair is proved at every joint during the process of jointing—the joints being made consecutively—by means of a battery and galvanometer. Assuming that the pairs have been properly selected at the end of the cable, this has the effect of:

(*a*) Precluding pairs from being jointed crossed.

(*b*) Indicating a cross which may have been carelessly interposed at the joint last made.

On completion of the jointing a rough test of the section is desirable as a means of detection of faulty wires. The test may be made in a manner similar to the preliminary test previously described.

Labelling.—It is customary to assign a number to each pair of a completed cable for purposes of distinction. The method of testing out is well known, and explanation is unnecessary.

Test for Crossed Pairs.—Every completed section is subjected to a test for crossed pairs which may have escaped notice during the loop tests made at each joint. The test is diagrammatically illustrated in Fig. 3, and consists in sending round the whole of the pairs connected in parallel an alternating current, each pair being taken one at a time and connected to a telephone receiver. In the diagram it is assumed that a cross exists, and if the circuit be traced it will be apparent that when the receiver is connected to a pair that is crossed with another one a hum will be heard on placing it to the ear. Any such pairs which may be found are labelled accordingly. When the whole of the faulty wires have been detected, it is decided whether the faults are to be located and cleared at once or left for attention as suitable opportunity occurs.

Terminating Dry-Core Cables.—The effectual termination of dry-core cables is a matter presenting some difficulty. Provision has to be made for termination in positions fully exposed to all climatic influences as well as in protected places, but in all cases there exists

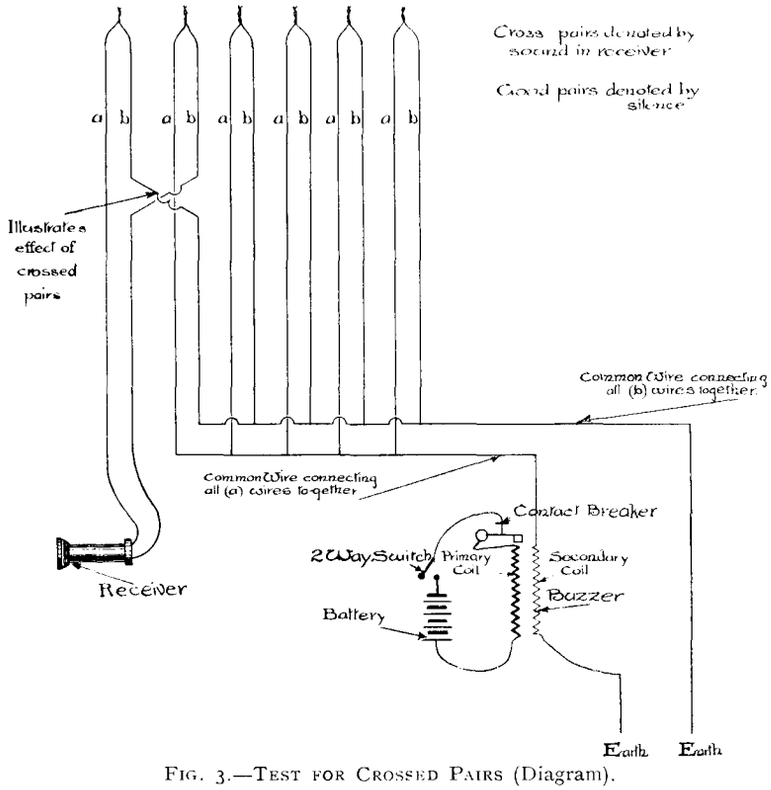


FIG. 3.—TEST FOR CROSSED PAIRS (Diagram).

the possibility of penetration of moisture to the cable core. Three typical methods of termination in present use are mentioned below:

1. *Cable Heads or Terminals.*—In these the end of the cable is hermetically sealed within a metal or other chamber, connection being made to the external circuit by means of suitable insulated terminals. Details of a terminal of this type, designed by Mr. S. P. Grace, of Pittsburgh, and made by the Western Electric Company for external use, are given in Fig. 4. In consists of a cast-iron chamber with suitable lugs for attachment to its support and a cast-iron lid hinged at the top. In a recess in the box there is fitted a porcelain block, through which brass pins extend, provided in the inside with soldering tabs and on the outside with screwed nuts and washers. The cable enters through a brass nozzle to which its sheath is plumbed, and the wires are soldered to their respective tabs. The rear compartment is subsequently filled with molten insulating compound through a hole at the top, which is afterwards sealed by a screwed plug. Connection to the external circuit is made by rubber insulated leaders as shown.

2. *Pot-heads.*—The cable is sealed by jointing its wires to vulcanised indiarubber leaders enclosed in a lead sleeve—to which the cable sheath is ultimately plumbed—impregnated with a molten compound, which, when set, forms an air-tight plug. Pot-heads are usually manufactured locally as follows:—The requisite number of vulcanised indiarubber leaders are cut to the proper length, and at one end of each the outer tape and braiding is very carefully removed for a distance depending upon the size of the pot-head being made. It is essential that the dielectric should be stripped clean and be free from injury. The leaders are then tightly and neatly bunched, the stripped portions being laid evenly together, and a lead sleeve of the proper diameter and length is slipped over them and secured at such a point that it encloses the stripped portions, sufficient only being left protruding for jointing to the dry-core cable. At this end the lead sleeve is beaten on to the stripped leaders, which are protected from injury by a binding of insulating tape.

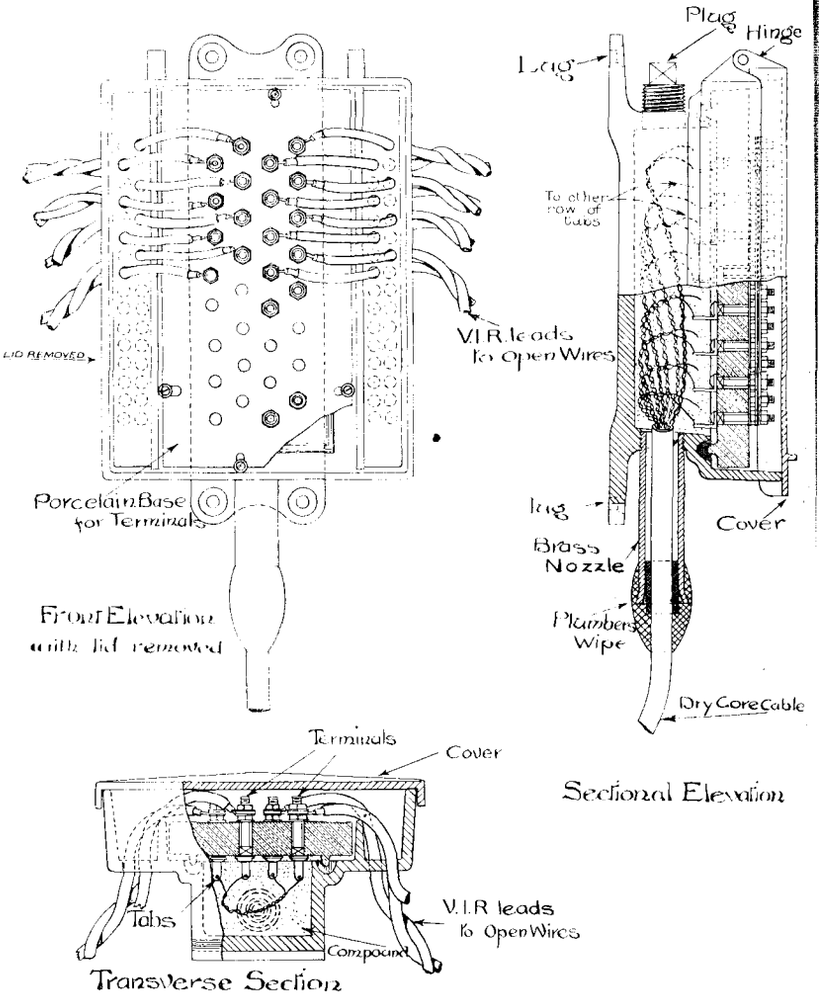


FIG. 4.—CABLE TERMINAL—WESTERN ELECTRIC TYPE 14 (Drawing).

Insulating compound at a temperature of from 250° to 280° F. is then run into the sleeve in such a manner as to ensure it being well filled and the leaders being thoroughly enveloped. When cold, an air-pressure test is applied, the mouth of the sleeve and the leaders being immersed in water so that a leak may be indicated. If sound, the pot-head may be used as it is for sheltered situations, but for exposed positions it should be fitted with a lead cap of suitable dimensions. The inverted cap is partly filled with melted compound, and after the leaders have been doubled back and uniformly arranged along the pot-head sleeve containing them, the same is inserted and forced well into the cap, superfluous compound being expelled. When cold the pot-head is complete and may be jointed to the dry-core cable in the usual manner. Fig. 5 is from a photograph of a completed pot-head, and Fig. 6 is an illustration of a pot-head mounted on a pole.

3. *Terminating by Means of Silk and Cotton Lead-Covered Cable.*—For inside positions the present practice in terminating a cable of over 50 pairs is to joint it to a special length of silk and cotton insulated lead-covered cable, the intervening joint being filled solid with paraffin wax as a means of isolating the paper core from the atmosphere. The end of the silk and cotton cable, which is to be connected to the terminal apparatus and will be permanently exposed, is stripped of its sheath for the necessary distance, and the exposed core is immediately well saturated with beeswax. The beeswax should be maintained at a temperature of not less than 200° F., preferably by means of a water-jacketed waxing tank, and the cable should not be withdrawn from the wax until the cessation of bubbling shows that all moisture has been expelled. The wax is allowed to penetrate under the lead sheathing as far as possible so that air is excluded from the cable core. Afterwards the waxed wires are formed out in a manner consistent with the disposition of the terminals to which they are ultimately to be connected.

The joint between silk and cotton and dry-core cables is made in the usual manner except that the wires are left a little looser and that the ends of the joint are packed with dry cotton-wool interposed between the layers. The taping is omitted, and after being thoroughly dried the joint is plumbed. If the respective tests for insulation and plumbing are satisfactory the joint is immediately filled solid with pure paraffin wax. When cold another insulation test and an air-pressure test are applied.

Air-Pressure Test.—To prove that the sheath of all jointed cables is sound an air-pressure test is desirable. Air which has been chemically dried is applied under pressure to one end of the cable until a pressure of about 12 lbs. per square inch is registered by special pressure gauges fitted at its extremities. The air supply is then shut off, both gauges being left connected. If the pressure is maintained without appreciable drop for, say, ten hours, it may be taken as proof that the cable sheath is air-tight and the cable may with safety be brought into use.

Tests for Insulation, Conductivity and Capacity.—It is not intended to describe these tests, as the methods adopted and apparatus used are well known. The capacity test is usually dispensed with. The conductivity test serves as a check as to length, and proves the resistance of the twisted joints. The insulation test is of greater importance as the insulation resistance is liable to considerable variation; 500 megohms per mile of circuit may be taken as an average standard, and when the dielectric consists of dry paper core only it should be much in excess of this. Pot-heads, cable-heads, and silk and cotton cables with filled joints detrimentally affect the insulation.

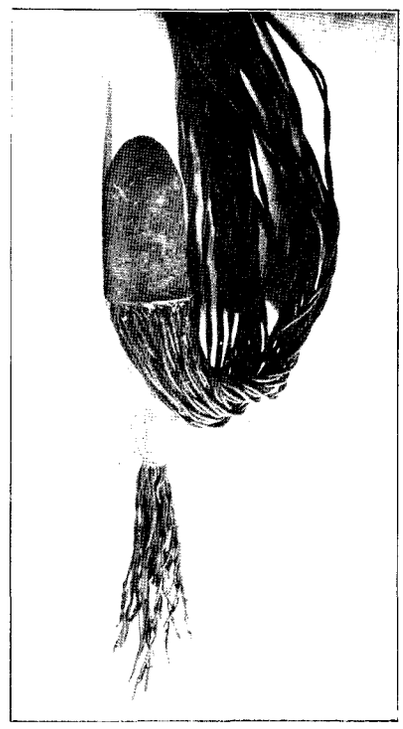


FIG. 5.—POT-HEAD.

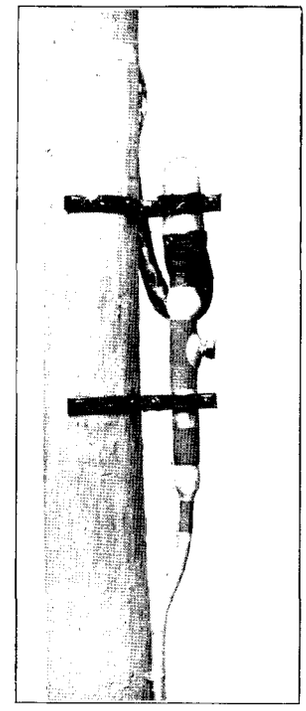


FIG. 6.—POT-HEAD MOUNTED ON POLE.

Desiccation.—An improvement in the insulation of air-space cables is readily accomplished. Atmospheric air, from which all moisture has been extracted by being passed through tubes containing calcium chloride, is forced at a pressure of from 15 to 20 lbs. per square inch through the cable of low insulation. The

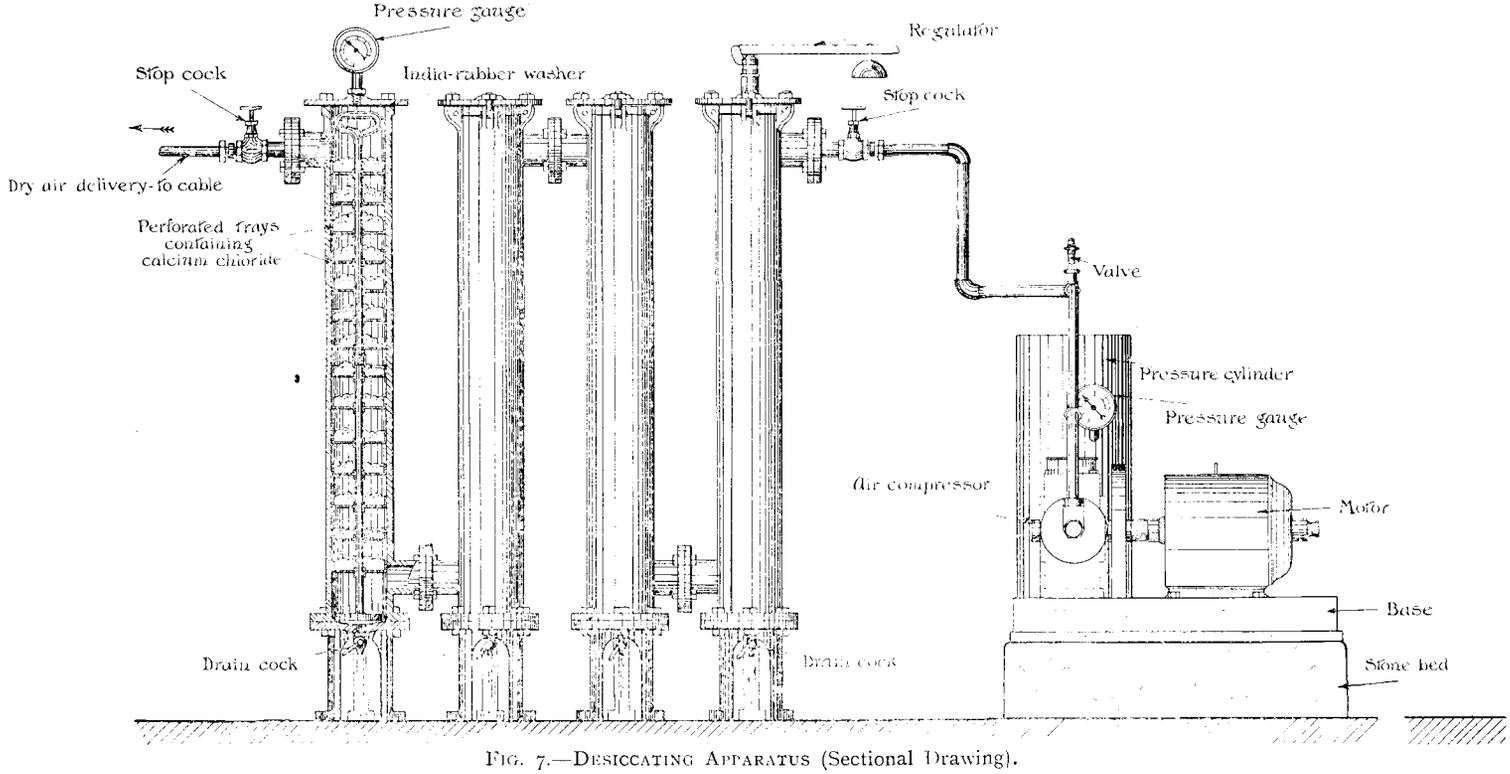


FIG. 7.—DESICCATING APPARATUS (Sectional Drawing).

moisture is absorbed by the dry air and expelled along with it at a vent opened in the cable at a suitable point. Fig. 7 represents a desiccating apparatus which is being fitted by the National Telephone Company at its important exchanges. A motor-driven air compressor supplies air at regulated pressure to a chamber which is connected to four vertical cast-iron cylinders. The cylinders are connected in series, and the chloride of calcium is distributed within them on perforated brass trays supported at equal intervals by a central rod. Each cylinder is provided at the top with a flanged lid secured by bolts and made air-tight by a rubber washer, and at the bottom with a blow-off cock for drawing off the extracted moisture. The first and last cylinders are fitted respectively with a lever valve for regulating and a gauge for indicating the pressure.

LONDON AND ITS ORGANISATION.

By J. STIRLING, *Chief Accountant, London.*

(*Concluded from page 71.*)

ON one recent day 1,884 receipts were issued by the cashiers, 1,471 of these being sent by post. It is no unusual thing at certain periods of the month to deal with close on 600 callers per day in the rentals and cashiers' offices; this apart from innumerable telephone enquiries on all kinds of subjects.

For public convenience, as well as to facilitate the posting of all payments to the various books, each receiving cashier is allotted certain letters of the alphabet, and only deals with payments from firms whose names begin with one of those letters. The work is thus distributed equally, and a uniformed attendant is always on duty to direct callers to the proper quarter.

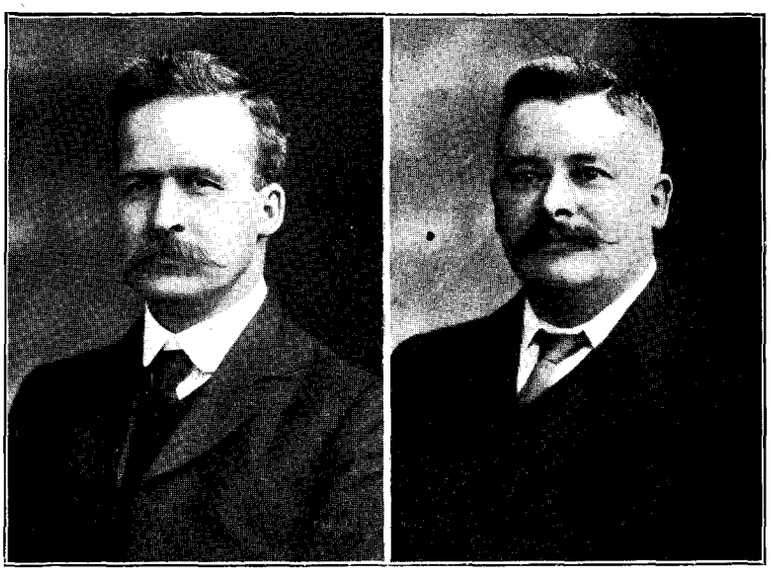
The payment of wages and preparations therefor necessarily occupy much of the time on the paying side. A staff of over 4,000, most of whom are paid weekly, is not easily provided for; the difficulties are increased when that staff is scattered over a territory of 640 square miles. In one or two of the more outlying places the payment is in the hands of the engineer's clerk, but as local clerical staff are few in number, and have, as a rule, an adequate supply of other work, the bulk of the paying must be done from headquarters. On Friday, when the paying begins, thirteen men are employed on it, nine of these being call office collectors, who for that day are relieved of their ordinary duties; on Saturday only nine men are required to deal with the balance.

In another branch of the cashier's office the pay-rolls are made up, staff records kept, and forms for new staff, changes, etc., dealt with. One feature introduced a few months ago is the deduction of weekly season ticket payments through the pay-roll. Arrangements have been made with several railways by which the staff can obtain tickets through the Company and pay for them in this easy method, instead of having to provide a lump sum for three months in advance. In London, where nearly everyone must travel to business, this is a great boon. Many of the Head Office staff have also availed themselves of the privilege.

The wayleave particulars are entered up in 50 registers, each group of books corresponding with the divisional engineers' districts. If details of an existing easement are required by an engineer, they are obtained by telephone, the number of such enquiries averaging 60 per week. Unfortunately the records of very old easements are far from complete, and this increases the difficulty of dealing with enquiries. The total number of wayleaves in London is about 70,000.

Public call offices are more and more occupying a prominent place in the economy of London's business and social life. Experience has proved that it pays to devote special attention to call office development, and to the nursing of the call offices once they have been established. Along the beaten tracks of the City and West End the latest puzzle is to find a space of 100 yards in which there are not one or more of the beckoning bell signs. Even in districts where the average visitor to London never penetrates the ubiquitous swinging bell is met at every turn. Just as the tubes have helped to revolutionise London traffic, so have they assisted to solve the problem of prominent and accessible call office sites. The popularity of the Central tube stations as telephone resorts has increased to such an extent as to outgrow the accommodation available. If a visitor "doing" London wishes to see the London public making its appointments, and availing itself of a remedy for bad memory, let him visit Piccadilly Circus Station and watch the call office traffic as it ebbs and flows, and the smart uniformed boy attendants deal with the needs of the various callers in that alert manner which is one of the attributes of the London *genus puer*. The number of call office lines in London is 2,900, of which 2,350 are fitted with automatic boxes. Eighteen collectors are employed for clearing these, and are supervised by a special officer, who also deals with all questions as to lighting, position of cabinets and the numberless other points which constantly arise over call office management. One point which is being emphasised daily is that the public prefer using the telephones at railway stations rather than those in private premises; the moral is obvious.

The statistical office (abbreviated "S. O.") fills an even more important place in the organisation scheme than its name implies. Some day perhaps a genius will arise who will define accurately, in a phrase or an epigram, the difference between figures and statistics. Our statistical office deals largely in both, and, in addition, issues all works orders, analyses the wages, keeps the cost forms and generally casts a watchful and critical eye upon all proposed and actual expenditure. Through its medium the Chief



J. LESLIE,
Chief Cashier.

R. BRYSON,
Chief Rentals Clerk.

Accountant keeps in touch with all revenue and expenditure results, and is able to place before the Metropolitan Superintendent such information as he requires on matters of finance.

The mere issue of over 50,000 works orders in one year is no light task, but when the authority for each has to be carefully scrutinised to see that nothing irregular slips through, and further, a parental control has to be exercised over both outward and return journey, the magnitude of the work is considerably increased. During the first three months of this year 13,153 separate wages items were posted to cost forms, the figures giving some idea of the analysis work done on the pay-roll.

The statistical office also boasts of the nucleus of an intelligence bureau. Anything savouring of fraud or robbery comes under its purview, and it has in this unfortunate connection become "well-known to the police." Call office boxes seem to present an irresistible attraction to the petty thief, although even the practised burglar has not disdained to smash one occasionally. Over 260 attempted and successful automatic box robberies were dealt with during the past twelve months; also 65 sundry thefts of wire, stores, etc. It is gratifying that these are on the decrease, and one would fain hope that the effort to deal with them in a systematic manner may have helped on this consummation. One indirect result may be to enable one or two of the staff to qualify for posts on the Metropolitan detective staff should contingencies

two and a half years hence compel a change of employment. As the Chief Accountant is also the Metropolitan Superintendent's auditor the statistical office includes audit work amongst its multifarious duties. One officer at least is constantly travelling round, not for the purpose of finding fault, but of putting wrong things right, finding out weaknesses of organisation, which so often mean misapplied energy and waste of money, and generally reporting on the condition and methods of the various offices. In London, with its numerous channels of expenditure, some independent observation of this kind, outside the spending departments, is a proved necessity.

A. GRAY, Statistical Officer.

E. A. C. SANDY, Chief, Correspondence Department.

The monthly estimates undergo a very rigorous scrutiny, the estimate clerk's position being the equivalent of the cost clerk's in a district office, only on a larger scale. Costs queries are always with us, and in London we get numerous examples of how incessant watchfulness is repaid. The elucidation of one case has so often revealed the existence of an entirely wrong principle applying to hundreds of other cases, that one is being constantly reminded how great results "from little causes spring."

The correspondence office, which is the last of the four sub-departments, has one or two unique features. All written matter from and to every department in the building passes through the correspondence room (see Fig. 4). Each week it receives 21,000 letters and memoranda, and dispatches 3,800, in addition to accounts, notices and receipts; the total dispatches number 18,000 per week. Its boy "Mercuries" effect six regular deliveries per day to each department in the building, and all typed matter is also distributed to the officers who have dictated it in time for signature before the hour of closing. Messengers likewise make two visits per day to Head Office and the larger divisional offices, this method being more economical and rapid than posting.

In the morning the opening of letters commences at 6.30 a.m. in summer and 7 a.m. during the winter, six clerks being employed on it. All letters which do not bear a correspondence reference are handed over by the openers to the senior clerk of the Correspondence Department, who marks them with the code reference of the officer within whose province the matter lies. All letters are then entered on quarto sheets, a carbon copy being retained. Only the name of the correspondent, without any details of subject matter, appears on the sheet, it having been found that this was ample for each officer to check his letters received, and for the Correspondence Department to tell whether a communication had come and to whom it had been handed. To mark out correspondence so that it may reach the proper officer will seem to the uninitiated a simple matter; a morning spent conning the London letters would effectually disabuse one of such an impression, and would, at the same time, afford a glimpse into the depths of ambiguity which can be reached by some letter writers.

All outward correspondence is dictated by telephone. There are about three privileged persons who claim exemption when they occasionally desire to dictate to a typist direct, but even they are not encouraged, and, as they are exceptions, can always be adduced to "prove the rule." Each typist has a typewriter at the left-hand side of her machine; special correspondence lines are run from the various offices in the building to a switchboard in the correspondence room, and immediately an indicator drops the senior lady clerk connects the lines to one of the available instruments. When the system was inaugurated, headgear sets were used, but the time taken in getting the instrument adjusted when a call came through militated against rapid work; hand-microphone sets are now in use, and answer the purpose admirably. The typists take all the letters down in shorthand before typing; some experiments have been made with direct typing from dictation, but economically the balance was in favour of the existing method. That result, while disappointing, was not surprising; comparatively few people have at command a ready smooth flow of that simple English so essential in a good letter, and natural hesitancy of utterance would be accentuated under such conditions. We hope to try again.

The filing of correspondence and papers of all kinds is not an easily solved problem. Our process is simple and works well. Unimportant letters, such as acknowledgments, requests for statements of account, demands for wayleave rents, etc., are destroyed after having been dealt with. All correspondence worth preserving is separated into three divisions: (1) subscribers; (2) non-subscribers; (3) service. Those under No. 1 are endorsed on the front with the subscriber's telephone number and filed in numerical order in the case allotted to his exchange; No. 2 contents are put in cases alphabetically; No. 3 are arranged in alphabetical order

A MORNING'S CORRESPONDENCE.

under the subject matter. Two exceptions to these rules should be noted. Complaint letters are filed separately under exchange and telephone numbers, and are kept for two years. Letters enclosing remittances are also dealt with separately, being kept in special cases in alphabetical order and destroyed at the end of two months. When filed papers are required by any department, a special printed slip, on which particulars have been inserted, is handed in to one of the filing clerks, who, on extracting the papers from the case, attaches a coloured paper docket, giving name of department requiring them and date taken from file; this must be kept attached until the papers are returned, as it is also a guide to the particular file from which they were taken. In the latter, the request slip remains as evidence of whereabouts until the papers drift back.

Completed works orders are great devourers of space. They are packed in small cardboard boxes, measuring 12 inches by 6 inches by 9 inches, each box containing between 200 and 300 orders in consecutive numbers. We find the arrangement both convenient and satisfactory. In the City, where even basement rooms command enormous rents, it is of the utmost importance to husband accommodation. Destruction of old papers and books immediately the safety line is reached is essential; some officers who have an inordinate craving for ancient records call us over-zealous in that respect. The "come in useful" theory may be all right with old clothes—a clinging affection to them is justifiable—but no self-respecting office should allow itself to become a receptacle for aged tomes and folios.

City life and work in a City office have many advantages. One disadvantage, however, is the wear and tear to the physical system, particularly during the winter months when "King Fog" and his satellites hold sway. The number of man-days lost through illness by the clerical staff in the Metropolitan office during 1908 was 1,073. The annual epidemic of influenza accounted for no small proportion of this. The total is large, but is not a big percentage for the year. Londoners will tell you, and with cause, that their City is one of the healthiest in the world; we are inclined to forget that sometimes when the sick list is unusually heavy and resources are strained to provide relief. The elasticity of our organisation has been well tested in that respect.

One feature which has to be rigidly guarded against in the general organisation is the ever-present, though sometimes dormant, tendency to "circumlocution office" methods. It has spasmodic eruptions, which, when discovered, are treated as symptoms of an infectious disorder, and the cases promptly isolated prior to the trouble being stamped out. Officers of all ranks have fallen victims at times, and they invariably call it "keeping in touch with what goes on." It is an insidious disease, which, like a well-known classical ailment, "doth make the meat it feeds on"; frequently the only cure is surgery. In all communications on departmental subjects therefore, and in the distribution of letters, the aim is to get promptly and directly to the man who will deal with the matter—not to let it filter to him through devious channels which only cause delay. In this we have succeeded to a remarkable degree, and if these disjointed jottings are ever continued, so as to include other branches of the work, that will be not the least important point to be referred to.

I yield to the temptation of ending with a moral precept; it is culled from a great sixteenth century writer:—"Preserve the rights of inferior places, and think it more honour to direct in chief than to be busy in all. Embrace and invite helps and advices touching the execution of thy place, and do not drive away such as bring thee information, as meddlers, but accept of them in good part."

OPERATING REMINISCENCES.

BY AGNES DUGGAN.

WHEN I entered the service of the United Telephone Company at Dublin in July, 1881, the staff there consisted of a manager, three clerks, a lady operator and a handy man who acted as fitter and electrician, and who carried or had a boy to carry his tools, which were placed in a straw basket strapped over the shoulder.

The switchboard in use at this time was the same as that shown in the JOURNAL for April, 1909, as being the one in use in Coleman Street Exchange in 1879, and had about twenty subscribers working.

The first operator to work this switchboard with about five subscribers working in Dublin was a boy, who was so overwhelmed with work that he frequently found time (or took it) to have a game of marbles in the adjoining courtyard, and who a little later had the audacity to ask for an increase of salary, or as he termed it "a rise," when he was promptly asked if he meant "over the banisters."

When I started to work this switchboard, the calls being few and far between, I found it very monotonous, and to relieve the monotony (not being able to play marbles) amused myself by swinging the cords (which, when in position, hung from the top of switchboard and were known as upper A and lower A, upper B, etc.) to and fro like the pendulum of a clock.

As subscribers increased a second switchboard was added, the Edison pegboard (No. 4 in the April number of the JOURNAL). This board was a great favourite, it was very neat, and we found the testing of our lines each morning very interesting, our method being to place all the subscribers' pegs on one bar, ring all together and then pull them down and guess who would answer first. This switchboard was a great favourite with a well-known doctor in this city who was quite an expert at it, and who when missing at home could always be got in the exchange where visitors were allowed to come and go as they pleased by way of advertising the telephone. The next switchboard that was fitted had very small fragile indicators, which would all drop and keep shaking like leaves, and one of the duties of a new operator was to keep them closed. Later came the slipper board with double cords, Blake transmitters and receivers mounted on brass poles. This was a most distressing board to work, as the connecting had to be done by the calling of one operator to another for the number she required, and as several called together it was a case of the survival of the fittest. The cords while waiting for use were hung on hooks at each position, but the operator who did the switching, as it was called (there being two others to do the speaking, *i.e.*, three operators to 100 subscribers), mostly carried the cords over the left arm, and when disconnecting placed them again on the hook to her right, so that by degrees they worked down to the end of switchroom and the operators at the top positions, having vainly appealed to those at the end to send up cords, would walk down and carry off all they could lay hands on.

Up to the time this switchboard was erected the accommodation for operators was of a very primitive kind. Dining-rooms, resting and dressing-rooms, dinner clubs, etc., were not known, the only combined luncheon and dressing-room being a portion of the switchroom, shut off by a green baize curtain, inside of which there was a small gas stove on which to boil a kettle, tea and coffee being the only luncheon that could be got—and that with difficulty. One day this stove got offended at being the only one shut out of switchroom, and for revenge burned up a hat and feathers and then it was dismissed.

The operators' hours were from nine o'clock to six o'clock, and later twelve o'clock to eight o'clock. Continuous service was not known, and the subscribers rarely gave telephone numbers, but called for one another by name or name and address. There was no training of operators, but they were generally handed a list of subscribers and told to learn the names and addresses, and later it was not unusual to hear them repeat them like a song, and at the same time point them out on switchboard, so that Dublin can claim to having had the first school, the map being the switchboard.

In 1882 the derrick on the Commercial Buildings required altering, and a temporary exchange was opened in Abbey Chambers. There were about 200 wires working in this exchange, which was connected with the Central by leads, and of this exchange I had charge, and with four or five other operators worked it till the wires were brought back to Central and the exchange closed, sometime about 1884. I have many recollections of this exchange, particularly of an August Bank Holiday, when most of the operators had the day off, regardless of the traffic, which I suspect was never thought of in those days. The operators on duty, who had had more work than they could do satisfactorily, worked away till four o'clock, when the weather, which had been very fine, suddenly changed to thunder and lightning. The switchboard stood in the centre of the office, between the door and the windows, which were open, and as each flash came along the operators disappeared from the switchboard, and watched (with intense interest) from a distance, or rather from the inside of a press with the doors slightly open, the coils on switchboard fusing, particularly that of a troublesome subscriber who had never ceased to call.

If a subscriber complained of not being able to get exchange, it was not unusual for me in those days to go to the back of the switchboard, and if I found a terminal loose, screw it up, or if a wire off, join it up, having first held it on to a knife and rung out on it to find the owner, and then tell the subscriber "line now O.K." Often I would adjust my own or another transmitter in the switchboard, or tell the electrician where to find the fault he was sent to clear, and sometimes on answering a ring a voice would be heard

saying "Don't mind, Miss, its only So-and-so replenishing the batteries."

About 1894 another switchboard, or rather a portion of the old Liverpool board which was partially burned, was erected. The transmitters, which were fixed to the switchboard, were trumpet shape and very awkward. This board was worked till Whit Monday, 1900, when a change-over was made to the present exchange in Crown Alley.

Things have changed very much for the better, both for the subscriber and the operator, since I entered the service. Subscribers were very pleased in those days if they got through at all, and seconds were unheard of in connection with a call, but I doubt very much if the same subscriber could now be satisfied by being answered and got through in as many seconds as it took minutes before.

The operator is much better catered for now. There are innumerable improvements in the switchboard equipment, a regular scale of pay, regular hours of duty, dinner clubs, dining, resting and luncheon-rooms, a clerk-in-charge, supervisors, monitors, electricians and others to help her and make her work as easy as possible, compared with the uphill work of long ago, when an operator had to turn a handle, work a treadle, operate and hold a receiver to her ear, and at the same time call out her numbers. I may mention, by the way, that in the days when I had to call out numbers, I had an idea which I did not ventilate at the time. It was to work a disc by press-button from the calling position to the called position (the disc to show the colour of the calling position), so as to attract the attention of the operator required. I see by April number of the JOURNAL that the Metropolitan Superintendent brought out something which had much the same effect.

THE TELEPHONE STATIONS OF THE WORLD.

BY W. H. GUNSTON.

EUROPE *(continued from page 68).*

Austria-Hungary.—There were 124,325 stations in the empire at Jan. 1 last, to which another 500 may be added for Bosnia and Herzegovina.

In Austria there were (Jan. 1, 1909) 80,975 telephones under the State Administration at the beginning of 1899 there were 27,303. In 1889, when the telephones were in the hands of the Telephone Company of Austria, an English concern, there were 4,500. The following are the particulars relating to the principal towns:—

	1889.	1899.*	1909.
Vienna ...	1,600	12,500	35,011
Prague ...	610	2,300	5,564
Trieste ...	—	1,100	2,870

* Estimated.

In Hungary, where the telephone is also under State ownership, the present number of telephones is 43,350. In 1899 it was 12,869. The number of stations in Budapest at the beginning of the current year was 13,906, in Fiume 1,262 and in Zagrab 1,161.

Switzerland.—State ownership. The present number of subscribers' stations is 69,122. In 1899 it was 35,824 and in 1888, 7,626. The principal urban systems are Zürich 9,576 telephones, Geneva 6,384, Basle 5,670 and Berne 3,743. In 1897 there were 4,400 subscribers' lines in Zürich, 3,264 in Geneva and 2,025 in Berne.

Italy.—The State has lately acquired the systems of the Società Generale and the Società per l'Alta Italia (see JOURNAL for April, 1908). The number of stations at Jan. 1, 1909, was 53,721, of which 9,179 were in Milan, 8,015 in Rome, 4,518 in Genoa, 3,687 in Turin, 2,585 in Florence and 2,578 in Naples. In 1900 there were 13,859 telephones in Italy and in 1889, 9,183.

Russia.—The telephone at St. Petersburg is in the hands of the municipality; at Moscow and Warsaw in the hands of Swedish companies; and elsewhere it is operated in some cases by the State and in some cases by concessionaires.

The number of telephone stations in the Russian empire at the beginning of 1908 was 97,643, of which 19,394 were in Moscow, 16,410 in St. Petersburg, 12,503 in Warsaw, 4,737 in Riga, and 3,181 in Odessa. Ten years ago there were 23,841 telephones in Russia, and in 1889, 7,585.

Spain.—The number of telephones in 1908 was 18,545, of which 2,975 were in Madrid and 3,549 in Barcelona. At the beginning of 1899 there were 11,685, and in 1902, 12,819, of which 1,967 were in Madrid and 2,752 in Barcelona. The exchange systems are almost entirely in the hands of various concessionaires, and the trunk line system is owned by the North-Eastern Interurban Company. The State has less than 1,000 subscribers.

Portugal.—The telephone in Portugal is practically entirely in the hands of the Anglo-Portuguese Telephone Company, who have 3,401 subscribers at Lisbon and 1,539 in Oporto. The total number of stations in the country is about 5,000.

Roumania.—State administration. At March 31, 1907, there were 9,157 stations in the country; it may be estimated that there are at present about 11,500. Ten years ago (1899) there were only 2,951 stations.

Servia.—The number of telephones (which are worked by the State) in this country at the beginning of 1907 was 1,382. It is now 2,057.

Bulgaria.—State owned. The number of telephone stations at the beginning of this year was 2,039, of which 959 were in Sofia. Ten years ago there were only 362.

Greece.—State ownership. The total number of stations at the beginning of 1908 was 1,365. It may now be computed at 1,500 at least. In 1899 there were but 146 stations.

Turkey.—Before the establishment of the Constitution the importation of telephones into this country was prohibited. The Government now have under consideration the laying down of an exchange telephone system. In the meantime, a small private governmental exchange with about seventeen stations is working.

Luxemburg.—Ten years ago there were 1,721 telephone stations in this Grand Duchy, which has a small population and no large towns. At the beginning of 1907 there were 2,809, and by now there are probably upwards of 3,000.

Iceland.—This remote island, so interesting to Englishmen as preserving the ancient language of the Norsemen and Danes, appeared in telephone statistics of the Bureau International last year for the first time. At the beginning of 1907 there were eleven exchanges and 359 telephones.

Summary of Europe.

	Jan. 1, 1908.	Jan. 1, 1909.	Population per telephone.
German Empire	768,266	851,319	71
Great Britain and Ireland...	528,763	565,854	77
France	178,518	194,159	202
Sweden	150,948	156,000*	34
Austria-Hungary	108,457	124,825	209
Russia	97,643	113,000*	1,322†
Switzerland...	64,953	69,122	44
Denmark	60,825	67,339	38
Norway	49,398	53.726	43
Italy...	44,834	53,721	625
Holland	43,449	48,134	117
Belgium	34,818	38,503	188
Spain	18,545	19,500*	955
Roumania	—	11,500*	573
Portugal	—	5,000	1,085
Luxemburg...	—	3,000*	82
Bulgaria	—	2,039	1,970
Servia	—	2,057	1,306
Greece	—	1,500*	1,733
Iceland	—	500*	152
Total		2,380,798	168

In countries marked thus * the number of telephones at the beginning of 1909 has been estimated from the rate of progress in recent years.

† It should be remarked that the figures for Russia include those for Siberia and Central Asia. The development of Russia in Europe would therefore be rather higher than indicated by the figures shown.

(To be continued.)

STAFF TRANSFER ASSOCIATION.

REPORT OF AN INTERVIEW WITH THE FINANCIAL SECRETARY TO THE TREASURY ON JULY 15, 1909.

THE executive committee attended Mr. Hobhouse at the House of Commons on July 15.

Mr. Alsop, on behalf of the committee, stated that on behalf of the National Telephone staff they had a material interest in the Bill to amend the Superannuation Acts then before the House, inasmuch as the staff would become members of the Civil Service on the transfer at latest in 1912. They had observed that existing members of the Civil Service were given the option of adhering to the existing terms—roughly, a pension at retirement calculated at one-sixtieth per year of service, or of taking the new terms—roughly, a pension calculated at one-eightieth per year of service and a gratuity of one year's pay on death in the service. Seeing that in 1905, when the question of the telephone staff was considered the old terms were in force, it was submitted that it would be equitable to give members of the telephone staff on transfer—assuming that the Bill had in the meantime become law—the same option as if they had been members of the service at the time of the passing of the Act. Mr. Hobhouse pointed out that Clause 8 of the Purchase Agreement of Feb. 2, 1905, foreshadowed changes in the Superannuation Acts, and stated that he could hold out no hope that the Treasury would give the concession asked.

The committee further pointed out that Clause 6 (by which the compensation which the Treasury have power to give on abolition of office is very largely reduced) had created some anxiety, as the telephone staff recognised that immediately subsequent to the transfer there would be a great deal of change and remodelling in the service, and that such a period was peculiarly likely to be distinguished by the abolition of positions. As they read Lord Stanley's memorandum of Aug. 9, 1905, there was to be no loss of employment, and if a member of the telephone staff was appointed to a position which was subsequently abolished, another equivalent position was to be found, but in view of the anxiety created by the clause in the Bill which would reduce compensation in the case of National Telephone men to practically nothing, they would be glad of some further assurance. Mr. Hobhouse stated that he quite understood and appreciated the anxiety of the staff on the point which, although he had not gone into the matter fully, he thought would prove unfounded. He promised to see the Postmaster-General and ascertain if some further assurance could be given on this point.

PRIVATE BRANCH EXCHANGE ADVERTISEMENTS.

BY W. F. TAYLOR, *Contract Manager, London.*

THERE must now be scattered up and down the country several hundred private branch exchanges, to the extension telephones of which the public have access. How many of the subscribers who rent such installations from the Company adequately advertise the fact that the public can originate calls from their premises? How many of them realise that there is money to be made by selling calls? No doubt, when a private branch exchange is being arranged for, the contract officer who is dealing with the subscriber points out the advantages of fixing telephones in positions accessible to the public, and how a considerable portion of the rental charged by the Company, if not all of it, can be earned from the calls sold at a profit by the subscriber; but does the contract officer always put sufficient emphasis on the necessity for properly advertising the facilities afforded? The system is comparatively new in this country. The public have still to be told what it means and the facilities it affords. No doubt if we sit down and wait long enough the public will find out for themselves its advantages, but this is going to take many years. We know from bitter experience the length of time it takes to educate the public and to teach them the telephone habit. They have to be educated into each new phase of our business, and if this is true of the non-using telephone public it is unfortunately equally true of subscribers. In the measured rates we have introduced a new commodity into the business field. We sell calls at a wholesale rate to subscribers and allow them to be retailed. A provision merchant, say, buys calls from us in the same way that he buys eggs, and he has the power of selling these calls to the public at a profit, just as he sells the eggs. But if, in his shop, he does not display his wares to advantage, and if his catalogue does not mention eggs, is he likely to sell as many as he would if he pushed them well to the front and had a properly displayed notice over them pointing out their merits and the price? What is the window in a shop for? To display the shopkeeper's goods, of course, and to tempt the public to buy. If there were no shop windows would the shopkeeper sell as many things as he does? Certainly not. Then if we look at the telephone as a commodity, which by proper use can bring in money to a subscriber, why then place that telephone in some dark corner and expect a good sale of calls to be made from it? You may say that the "dark corner" illustration is exaggerated. Possibly. But the same argument nevertheless holds good if a telephone is placed on a counter, even when it is within reach of the public, if it is not properly advertised. The casual customer at the shop simply imagines that it is intended for the use of the staff, because he is not yet educated up to the point of expecting a telephone to be placed at his disposal at that point.

A similar argument of course applies to hotels, and indeed to all places where telephones are provided for the use of the public. Much can be done to remedy this state of affairs. Indeed, much has been done by a few renters of the private branch exchanges; but it should be our desire to bring those that have fallen behind into the front ranks. It is quite useless making a big splash when a private branch exchange is opened and then letting the matter die down. The public visiting hotels, stores, shops and so on, is always changing in a greater or less degree, and it is undoubtedly going to pay the private branch exchange subscribers to cater for the casual visitor. There need not be any very great expenditure. A few remarks in a circular issued to customers; a few lines here and there in a catalogue; a suitable sign at each telephone; or, where these are few and far between, a number of signs displayed in good positions throughout the building, giving details in as few words as possible, should prove quite sufficient. It is *not* sufficient simply to place an infinitesimal sign at each instrument, which the customer would require a magnifying glass to read, and it must be impressed upon subscribers that the public is short-sighted in this respect, and a good-sized striking advertisement is necessary if any profit is to be made. A subscriber may retort, on this point being laid before him, that the profit he is likely to make is so small that it would not be worth expending anything on advertising. The reply is of course obvious—that the profit is likely to be small because he will not spend anything to make it greater. It is worth while spending a few pounds at the outset on some permanent advertisements, which should be in such a position as to appear continually before the eye of the public frequenting the premises, and they should, before very long, pay a handsome dividend on the capital expended on them. The most effective advertisement of this kind I have yet seen, and which I consider it would be impossible to beat, is a large brass lamp, with a flashing electric light inside, with the words "Public telephone" in white letters on a blue ground and a hand pointing in the direction of the instrument. In the premises where this sign is to be found there are 50 odd telephones for the public use and there are 50 odd advertising signs also. It would be a very blind member of the public who failed to see and understand what was meant by the signs, which are placed on such a level as to readily catch the eye of the passers-by. I can vouch for the fact that the signs in question have induced people who have never in their lives before used a public telephone in a shop to venture a call, and having once made the plunge and finding how easy it is, a new user of the private branch exchange "pay station"—to borrow an American phrase—has been made, and the progressive proprietor is of course the gainer.

As a final word, the service question must not be overlooked. A bad service on a private branch exchange switchboard does away with any good which may be gained by an up-to-date system of advertisements, which are no good whatever if you cannot get the operator to attend to your wants under minutes. A user once disgusted by bad service is worse than a man who has never been a user; and the importance of a good service cannot be too strongly impressed upon the private branch exchange subscribers.

I think Head Office might consider whether it would not be possible to issue a nicely got-up circular, to be sent to private

branch exchange subscribers, pointing out what should be done to make their installation a success and to increase the calls from the public stations, as it is in the Company's interests as well as subscriber's, to increase the calls from such installations.

TELEPHONE WOMEN.

XLV.—AGNES DUGGAN.

MISS DUGGAN entered the service of the United Telephone Company on July 18, 1881. At that time that Company, whose head office was in Coleman Street, London, had its Dublin offices in Commercial Buildings, Dame Street, and the number of subscribers in that city was about twenty. In 1882 the Telephone

AGNES DUGGAN.

Company of Ireland (working under a license from the United Company) took over the business, which in 1893 was acquired by the National Telephone Company.

On the resignation of the clerk-in-charge in 1888 Miss Duggan was appointed to that post, which she still retains.

At that date, however, there were but 500 lines and three sub-exchanges in the Dublin area., In 1900 a change-over was made under Mr. Gill's superintendence to the present exchange, with accommodation for 1,600 subscribers in Crown Alley, when Miss Duggan had the pleasure of putting through the first call and opening the exchange. The number of subscribers' stations served by the Central Exchange has now increased to 4,154.

During her long period of service Miss Duggan, some of whose interesting reminiscences are given in another column, has worked at most varieties of switchboard extant, has served under two superintendents (Mr. Gill and Mr. Cowley) and eight district managers (Mr. Porte and Mr. Butterworth, of the United Company; Mr. Bottomley, of the Telephone Company of Ireland; and Messrs. Gill, Gwyther, Ashton, Sibley and Currall, of the National Telephone Company). Miss Duggan was originally intended for the musical profession and spent many years in the Royal Irish Academy of Music. She is also fond of drawing.

XLVI.—ELIZABETH BRODIE HEALEY.

MISS HEALEY entered the service of the Lancashire and Cheshire Telephone Company, Limited, as an operator in August, 1883, and the whole of her business life has been spent in the Company's business. At that time there were about 100 subscribers in Blackburn and one trunk line to Manchester, six operators being employed. All calls were recorded in a book and a weekly report made of the number dealt with. Miss Healey has seen four changes in the system. Firstly, there was the Edison slipper board; secondly, the Gilliland board with call wire; thirdly, the earth circuit single-cord multiple board; and fourthly and lastly, the existing magneto call and clear.

When the Company handed over the trunk lines to the Post Office in 1896 seven of the senior operators were transferred, but the then district manager was unable to part with Miss Healey. During her long service she has served under eight district managers, namely: Messrs. John Chambers and H. Sutcliffe (Lancashire and Cheshire Telephone Company, Limited) and Messrs. R. A. Dalzell, F. Gill, B. Waite, J. Ashton, J. Scott and C. Remington (National Telephone Company, Limited).

The late Mr. Eli Heyworth was a frequent visitor to the Blackburn Exchange and took great interest in the switchroom and operating generally, at one time having a private office on the premises. Miss Healey is an enthusiast in operating work, and takes active interest in any social gatherings that may be organised. Over 50 per cent. of the subscribers in Blackburn know and are known by Miss Healey personally, and there is no doubt that the respect she is held in and the confidence they have in her has a great influence on the smooth working of the traffic at the Blackburn

ELIZABETH BRODIE HEALEY.

Exchange. Of a kindly and genial disposition she has endeared herself to the operating staff, who each and every one holds her in high esteem. During the whole of her 25 years' service she has only been absent for 21 days on sick leave. It would be interesting to hear Miss Healey's reminiscences, and it is to be hoped some day she will be able to give them.

The National Telephone Journal.

"BY THE STAFF FOR THE STAFF."

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THE PROGRESS OF HALF A YEAR.

THE completion of another financial half-year in the Company's history marks a further phase of its existence, and it will perhaps be not uninteresting to consider its position as the undertaking at present supplying the telephone service to the great majority of the telephone users of the United Kingdom.

The President, in his speech to the shareholders on July 22, pointed out that the amount expended on capital during the half-year ending June, 1909, was £313,393, being a reduction on the figures for the corresponding half-year in 1908 of £183,191, and he explained that this reduction was due to two causes—firstly, general bad trade; and secondly, the necessity under which the Company laboured of spending capital only on works that were going to be remunerative during the remaining period of its licence.

Some persons have erroneously deduced the idea that the plant of the Company was being allowed to lapse into a state of lesser efficiency than it stood at some few years ago. But in travelling about the country, it is apparent that the energy that has been shown during the last few years—and is still being shown—in constructing new exchanges on the most modern principles and in putting into them central battery apparatus of the latest type is most remarkable. It is not possible within the confines of a short article to enumerate all that the Company is doing, but starting in the north at Aberdeen the curious traveller would observe that a new exchange and equipment had been provided; working his way south he would find Edinburgh and Leith working entirely on up-to-date common battery principles, and the suburbs of Glasgow being dealt with on similar lines. Then coming to the great manufacturing districts of England, such as Manchester (where one of the finest exchanges in the kingdom has just been opened, and where the suburban exchanges are being converted to the common battery system) and Liverpool, where exactly the same process is in course, observing in passing Bradford, Leeds and Hull, which are not being neglected, and Birmingham, where not only a new central exchange has been opened but where also a considerable number of suburban exchanges are also being rebuilt, he would at length reach London, where he would observe that most of the great exchanges serving the Metropolis have already been housed in buildings which it would be difficult to surpass from a utilitarian point of view, and that a large number of the suburban exchanges are likewise being reconstructed. If from thence he turned for a moment to the west he would find Cardiff Exchange being entirely reconstructed and Bristol working on the common battery system, and would thus obtain ample evidence everywhere of a vitality and energy proceeding from the policy of not only keeping the plant up to date, but of doing work which must of necessity put the average condition of the plant on a higher plane than it has been in the past.

That this is no prejudiced view has been demonstrated by the remarks made by persons not connected with the Company—alike by ordinary English business men and by telephone experts—to the effect that the works that they had seen did not appear to them the works of a moribund concern.

It is said to be a habit of the Englishman to talk in a depreciatory manner of that which is his, and perhaps this accounts for the misleading statements that are sometimes made about the worthlessness and inefficiency of the Company's property. But if it were possible for the gentlemen who made these statements to be caught and conducted *nolens volens* on a tour of inspection over the territory served by the Company there is little doubt that their opinions would undergo a considerable modification.

THE TELEPHONE IN GERMANY.

CONTROVERSY still rages—or, we might more correctly say, flickers—in Germany with regard to the new rates which the Government proposes to introduce. We have before us recent academic and ponderous articles from *Der Tag* and the *Frankfurter Zeitung* which betray all the evidences of the professorial rather than the practical pen. The irremediable grievance of most German writers against the principle of payment by message is that it lacks absolute perfection. They argue that if a subscriber is charged per message he should also be charged proportionately to the yards, dozens of yards, quarter-miles, half-miles, and so on by which his premises are distant from the exchange, and that because this is impracticable all other efforts in the direction of payment in proportion to service rendered are futile. This seems much as though one should object to the principle of payment of fares per mile on the railway because all passengers do not occupy the same amount of room. Why should those of exiguous and sylphlike shape be charged as much as their more imposing and monumental fellows? The small not only have to pay for part of the space occupied by the great, but they often have to submit to the inconvenience of having some of the others' greatness thrust upon them. In strict justice all fares should be calculated per mile of line and per stone of passenger. The railway season ticket is again cited as a favourable instance of an unlimited rate; but the parallel is quite misleading. The season ticket holder travels a practically unvarying number of times a day (in most cases, one each way) between two points, and the railway

company can easily calculate what he should in fairness pay. The flat rate telephone subscriber makes anything between one and upwards of 100 calls per day, and payment based on an "average" obtained from such a variation is obviously unfair.

But the ingenious writer in the *Frankfurter Zeitung* makes a new point. He claims that the telephone call—like the quality of mercy—blesses equally (and, in many cases, more) him that gives and him that receives. Why, therefore, should the call be charged against the initiator of the conversation? Why, indeed!—except that such counsels of perfection are exceedingly hard to pursue. It might be a matter of conscience between users of the telephone that he who benefitted most should insist on paying for the call, and the principle might be extended to payment for letter postage and telegrams, both of which have invariably been paid for by the sender hitherto, irrespective of consideration whether he would benefit more than the receiver. To such subtleties does German profundity lead us. When, however, the writer in *Der Tag* talks about being "put off with the word 'engaged'" we know at once that we are dealing with one who has not an inside knowledge of telephony. That subscribers are sometimes rendered incredulous by the rapidity with which an operator informs them that the line they require is engaged is not surprising; but every telephone man, and every one who has seen the working of a multiple switchboard, knows that the testing of the called subscriber's line is an almost instantaneous process. That it is more satisfactory to the operator to complete a telephone call immediately than to reply "line engaged" is a commonplace of telephone work, but the gibe about "engaged" is as popular in all languages as the mother-in-law joke.

HIC ET UBIQUE.

A SOMERSETSHIRE clergyman sent the following letter to the Bristol office:—

Sir,—Complaint is made by widow B——, at Ellen's Cottages, that telephone wires are so close to her roof as to be a nuisance, and—as she asserts—actual messages are audible. I should feel obliged if this could be rectified.

Could the force of imagination go further?

ONE of those delightful weekly journals which constitutes almost the sole "literary" pabulum of hundreds of thousands of our fellow-creatures, has the following paragraph:—

WHEN THE WIRE BREAKS.

When a telegraph wire is broken or damaged, say, between London and Birmingham, or between England and Ireland, the operator, sitting in his office, can tell exactly where the accident has occurred.

The explanation is very simple. It requires force to send electricity through a wire. The longer the wire is the greater is the force required. This force is measured; but, instead of calling it pounds, as in measuring the pressure in a boiler, electricians call the units of electrical force "ohms."

Suppose a wire between two offices is 150 miles long, and that, on a stormy night, it gets broken somewhere. The telegraphist knows that when the wire was sound it took just 2,100 ohms to send a current through, or 14 ohms per mile. He now finds that he can send a current with only 700 ohms. He divides 700 by fourteen, and finds that the break in the wire is 50 miles from his end.

We had always been under the impression that the volt was the unit of electro-motive force; but we bow before the omniscience of the paragraphist.

If we substitute volts for ohms in a vain attempt at explanation confusion becomes worse confounded, and we have to swallow with somewhat of an effort that the voltage on a telegraph line varies between 2,100 and 700 volts.

On the back of the cutting sent us we notice a few lines of "Talks with the Engaged Girl," concerning *trousseaux* and the like, and what we are now wondering is whether as much reliance may be placed on the writer's technical knowledge of the subject as on that of the author of the paragraph "When the Wire Breaks."

THE SUPERVISOR: HER QUALIFICATIONS AND DUTIES.

BY P. J. MANTLE, *Exchange Manager Avenue.*

The Supervisor: Her Qualifications and Duties.—IT is not my intention to write a paper emphasising the importance of the part played by the supervisor in the rendering of good service. That has been done many times before, and has become axiomatic. Whatever justification there may be for this paper lies in the fact that we do not, as yet, possess a concise statement of the modern supervisor's qualifications and a schedule of her duties. I am aware that there is a Correspondence Class paper on "Traffic" which devotes a couple of pages to the subject, and I have by me an instruction book, issued on the introduction of central battery working into London, which also deals with the subject of supervisors' work; but neither of these can be considered comprehensive if judged by the latest conception of the supervisors' possibilities.

With the exception of one detail I do not propose to deal with monitorial work, which is a distinct subject, requiring consideration on its own merits, and can best be dealt with as such.

There are few details of our work about which we have altered our views with such evident advantage to the service as those which have reference to the supervisors' duties, and it may be instructive to recall the various phases through which we have passed.

In the beginning there were no supervisors, but only a clerk-in-charge, and, in some cases, a second-in-charge. Then, before the introduction of monitors' tables, we had supervisors who controlled large sections, the sizes of which were generally determined quite arbitrarily by the structural conditions of the premises, so that at one exchange the supervisors' section was one side of the exchange, and at another one floor.

In addition to these large sections all verbal complaints were dealt with by the supervisor in whose sections they arose, and there was at that time quite a large amount of work in connection with written complaints which also devolved upon her. This left but little time for the actual supervision of the operators' work, and it must be confessed that even this was performed in a distinctly perfunctory manner, the chief characteristics of which were statuesque poses, and much pacing to and fro behind the teams. The credit for this state of affairs rested, of course, with the management.

With the introduction of monitors' tables and the reduction of the size of the teams, the supervisors were free to devote their energies entirely to their operators' work But this change was largely retarded by the introduction of team work, which diverted their energies into making misguided efforts to do the team work by assiduously passing calling subscribers' numbers. It was only at a comparatively recent date that team work was left to the operators' initiative, and the supervisors' energies directed to the more useful sphere of training and checking the operators in the actual handling of calls.

It would appear that there still remains a good deal to be done in the matter of standardising supervisors' methods of work. Amongst other reasons for this belief, various communications to the JOURNAL show a considerable diversity of practice.

Before dealing with the details of the supervisors' duties it would be as well to consider the qualifications the supervisor should possess for the efficient performance thereof.

These include a good appearance (without which it is difficult to maintain the dignity of the position), businesslike style and habits, and a progressive turn of thought.

Inasmuch as her chief duty will be the training and development of junior operators it is imperative that the supervisor should possess a sympathetic temperament. A sound education should be a *sine qua non*.

The education of the supervisor in her profession is outside the scope of this paper, but stated briefly, it should comprise several years spent in operating A and B positions, during the latter part of which period the operator will act as understudy for her supervisor, and will be taught the principles of monitorial work, exchange clerical work and private branch exchange operating. To this must be added the study of telephone traffic science from

current literature and by the aid of the local telephone societies. During the probationary period of her appointment she should be personally instructed in traffic management and economics by the exchange manager or his representative.

The position of supervisor, whether in a large or small exchange, is one of considerable responsibility and trust, and although technical traffic knowledge and general smartness are essential, it is the personal element that is all-important, and the first and most essential qualifications in a supervisor are the attributes of a high character.

For this, if for no other reason, it is necessary that promotion from the operating staff should be determined by positive merit and character and not by seniority coupled with the negative virtues exemplified by a fairly clean record for work.

The accepted definition of a supervisor's duties is that she is responsible to the clerk-in-charge for the conduct and discipline of the operators in her sections and for the service rendered by them in accordance with the rules drawn up for their guidance.

We have to consider how this can be done most efficiently. As I have already indicated, in the past the supervisors did not get into sufficiently close touch with their service. Nowadays the chief items of a supervisor's work are training and checking the operators' movements and speech, and it should be laid down as a first principal that the normal position of the supervisor should be at the switchboard in circuit with her operators.

Having once got rid of the idea that it is the supervisor's duty to pass calling subscribers' numbers for the benefit of team work, except to a very limited extent, the supervisor has few claims upon her attention other than those directly associated with the operating in progress.

This coaching, which has been called "aural supervision," should be constant to be effective, though it does not necessarily follow that all the members of the team require the same amount of tuition. The junior members can hardly have too much, and if a high standard of accuracy is attempted it will always be found profitable to check even experienced operators.

To be effective coaching must be keen. It is more difficult to coach (*i.e.*, to follow the operator's movements and to check at the same time the quality of her transmission and articulation) than it is to operate, and it is apparent that the supervisor herself must have a high standard of accuracy and be speedy. It is by no means impossible, with practice, to observe the whole of the items of the operator's work at the same time. A difficulty may be met with in reconciling the irregularities noted when coaching, with the irregularities shown by the observation office returns, unless the supervisor is careful to make the necessary allowances for the fact that she can hear, using both ears, better than the observation clerk or subscriber, and as she is listening continuously is liable to overlook any clipping of words or expressions, if the operator goes out of circuit prematurely.

The knowledge the supervisor obtains of the attention given on the order wires and signal junctions, and the moral effect on the B operators is invaluable, as is also the check it affords on the subscribers' irregularities.

Coaching on junction positions is even more necessary, as it is so much more difficult to observe the whole of the junction operators' work by any observations made away from the switchboard.

It will be found necessary to revise the supervisor's standard of accuracy from time to time, as this, like that of the operators, tends to become lax in certain details such as articulation, through familiarity. This is best done by two supervisors periodically listening in circuit together, or by the supervisor listening in circuit with the observation clerk and comparing notes of the irregularities observed.

From the writer's experience a certain amount of difficulty is met with in trying to establish a system of more or less continuous coaching. This can be accounted for chiefly by the fact that it is harder work than its alternatives and that the supervisors find it difficult to break away from the old conception of coaching as a duty to be performed with the solemnity due to an important function, when there are no other duties with which she can busy herself. As a matter of fact it is work that suffers but little in its efficiency by interruption, and, in the aggregate, it is nearly as valuable in broken periods as when continuous. And while it is a fact that the operators do naturally work better when the supervisor is in circuit with them, yet it only needs systematic headset listening from the monitor's table to ensure that the standards enforced by the supervisors when coaching are maintained when she is not present.

With work which consists of a mass of small details, in all of which it is necessary to maintain strict accuracy, there is bound to be a large amount of correction, and it is necessary in order to avoid any semblance of fault-finding or nagging that the supervisor should be dignified and practice self-control.

Encouragement will be found far more efficacious than coercion in maintaining quiet and smooth working, punctuality and the observance of rules, though firmness is necessary to ensure perfect discipline and the due regard to admonitions.

In dealing with operating irregularities it is advisable to have a definite system, and, to ensure uniformity in the treatment of staff and to avoid depending too much on the supervisor's discretion, it is better to record against the operators all definite irregularities (*i.e.*, irregularities which are avoidable with reasonable care), and as some of these may in themselves be trivial to judge the operator by her irregularities in bulk rather than in detail. Such a definite rule, coupled with constant supervision, largely eliminates any element of chance, and it is more acceptable to the staff, precluding as it does any notion of favouritism.

It will I think be readily agreed that operating without enthusiasm can never reach a high standard. The supervisor's aim should be to make the enthusiasm of her operators extend to the whole of their work.

Provided with the stimulus of carefully compiled representative returns it is not difficult to instil the operators with zeal for team work, and to render them appreciative of praise for good individual work. With a view to their future development the supervisor should also interest her operators in all the published returns of their work and loads, and the science of telephony in general.

In the writer's opinion the attainment of most of our qualifications pre-supposes the possession of enthusiasm to a very considerable extent, and in the case of the supervisor it is the quality of her enthusiasm more than anything else that gives the necessary tone to the service her team is rendering. By instilling her operators with due regard for accuracy and promptness and the right sense of *esprit de corps* (as distinct from the mere spirit of emulation which seeks and is content with first place, regardless of all other considerations), she can establish a habit of businesslike endeavour that will be quite palpable to the subscribers and should lead to their recognition and appreciation of the efforts that are being made on their behalf.

In most exchanges the supervisor will be called upon to perform various mechanical duties. It should, however, be remembered, that her value to the service lies chiefly in her knowledge and control of the service. Work which can be performed by less highly skilled officials should be eliminated as far as possible. There will still remain such duties as the investigation of verbal complaints on dockets passed from the monitor's table; the routine checking of the pegs and marking on the switchboard; the summary of the operators' daily test of subscribers' lines, cord faults, and keyboard apparatus; the investigation and answering of written complaints; the disposition of operators at the switchboards at slack periods; the assisting in clearing cords on positions that have been vacated; the answering of calls from the monitor's table; and, in the case of the junction supervisors, the reporting of faults on dockets. A schedule of these and other duties is attached.

These duties, however, should not occupy a large proportion of the supervisor's time if the exchange management is ahead of its trouble and not behind it.

Under this heading come those duties requiring sound judgment, such as reports on the progress or otherwise of learners; reports on the relative efficiency of other members of the team; weekly reports of matters of current interest; suggestions for improving the conditions of service; and in short, that co-operation with the management which is of necessity delegated to the supervisor. Two forms are in use by the supervisors at my exchange, one a brief monthly report on all operators, and the other a full quarterly report on individual operators.

The possibilities of the supervisor will be largely determined by her ability to assimilate new ideas, her powers of organisation and knowledge of traffic science. Before she can be considered elegible for the higher positions of supervisor-in-charge or clerk-in-charge, she must acquire a thorough knowledge of the principles of organisation and of traffic returns, and their use in relation to standard loads. She should be familiar with observation work and standards, also with subscribers' office conditions and private branch exchange working. Some knowledge of contract office work and a capacity for selling calls are also desirable.

In London all candidates for the position of supervisor-in-charge or clerk-in-charge are required to pass a qualifying test in those subjects.

It may be suggested that the standards put forward in this paper are too high to be practicable. It must be admitted that individuals possessing to a marked degree all the qualifications enumerated are rare, but that does not alter the necessity for the qualifications, and I may point out that at my own exchange, the Avenue, without the advantages of central battery equipment, and with a load considerably above the average for magneto exchanges, we yet give first-class service—mainly owing to good supervision, carried out in an efficient manner—but as yet not fully developed on the lines I have advocated here.

In conclusion I would add that I am conscious of many errors of omission in this paper, but the subject is as large as it is important, and that must be my excuse for any apparent shortcomings.

SCHEDULE OF TEAM SUPERVISORS' DUTIES.

Daily—Coaching operators.
Reporting to the Maintenance Department, on carbon memorandum cords, etc., out of order and results of operators' daily test.
Answering verbal complaints on dockets.
Checking tickets, measured rate subscribers and call offices, check operators' lunch and tea times.
Daily routine check of multiple, indicators and switchboard apparatus (marking, labelling and pegging).
Collect tickets, message rate and call offices.
Weekly—Report on the team to exchange manager (traffic).
Report of apparatus faults (maintenance).
Report on one operator in the team for quarterly report.
Make out operators' time sheet.
Monthly—A short report on each operator in the team.
Supervisors' meetings with the exchange manager.
Quarterly—Load line.
Occasional—Record of effective Metropolitan and trunk calls.
Check operators' instruments.
Changing operators' instruments when out of order.
Deal with results of local observations (taken in the exchange).
Take up subscribers' irregularities noticed when coaching operators.
General supervision of teams before and after business hours.
Interviewing operators for correction and admonition.
Answering written complaints.

TWO NEW CENTRAL BATTERY EXCHANGES.

I.—DALSTON.

BY G. J. GAWTHORN, *Exchange Inspector, Dalston.*

THE quaint old building in Colvestone Crescent which had been used successively as a vicarage, mission hall and social club before it accommodated a telephone exchange, has now ceased to fulfil that purpose; and the Company have moved into new and commodious premises in Boleyn Road, Kingsland Green. These premises, including yard space, cover an area of four-fifths of an acre and were formerly used as a timber store. Extensive alterations were therefore necessary before they could be made to meet the requirements of the Company. These have been completed and the accommodation allocated as follows:—Ground floor, Metropolitan workshops and instrument store; first floor, engineers' and contract offices; second floor, Metropolitan stores, offices and apparatus room; third floor, switchroom and operators' retiring rooms. The yard is used as a depôt of the Metropolitan line stores for cable drums, poles and so forth. It will thus be seen that, so far as London is concerned, Dalston has become an important centre for telephonic purposes.

The exchange, though small in comparison with many other London exchanges, has steadily increased in size and importance of late years, as will be seen from a comparison of the late switchboard, which was installed in 1902 and only accommodated 680 subscribers, with the new switchboard to which 1,560 subscribers' lines are connected.

The switchboard in the old premises latterly occupied two rooms, and consisted of seven 24-line B positions and fourteen

FIG. 1.—THE YARD.

110-line A positions of the Ericsson type. The multiple extended over B positions only, local calls being operated over transfer lines.

The new board consists of seven A and three B sections of the Western Electric No. 1 type, with an ultimate capacity for 10,000 lines; but it is at present only equipped for 2,020 lines. It will be seen from the diagrams (Figs. 3 and 4) that the circuits differ from those used in some other exchanges of this type in

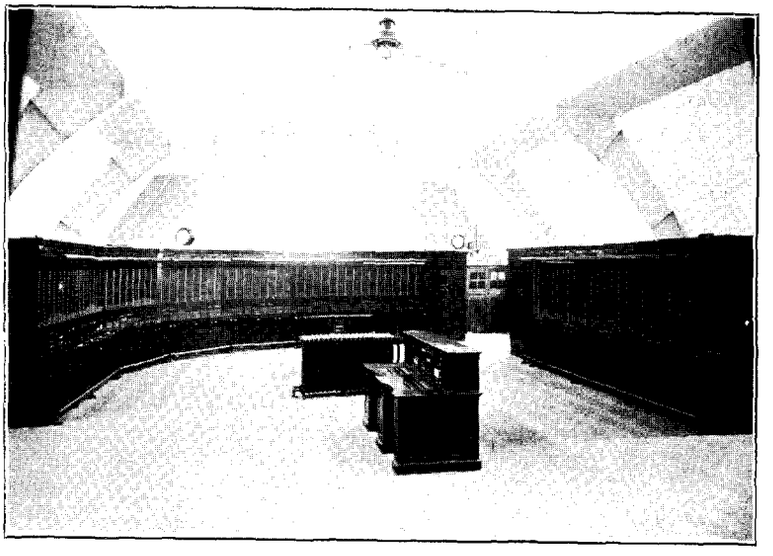


FIG. 2.—THE NEW SWITCHBOARD.

London, inasmuch as the supervisory and line relays are in the B line instead of the A line, and the A line of the line circuit is connected direct to earth instead of at a potential of 4 volts.

The main frame, seen at the right-hand side of Fig. 5, is at present equipped for 4,800 lines, the outside cables terminating on the vertical side, each strip of arresters consisting of 300 pairs.

The power plant consists of two 15-horse-power single-phase Wagner induction motors, each coupled to a six-pole Western

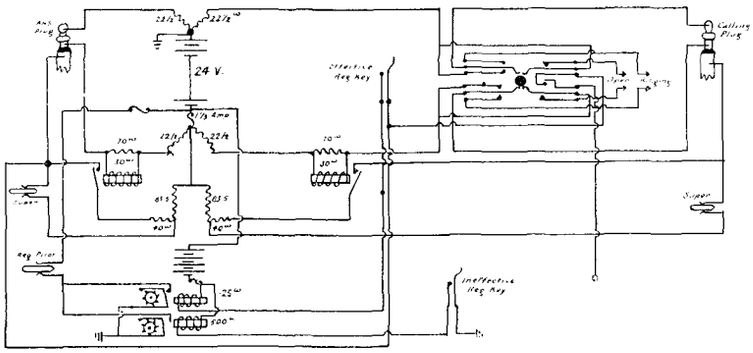


FIG. 3.

Electric generator (capacity 225 amperes at 30 volts) and two dynamotors for ringing, etc. The charging sets are mounted on four springs with the object of reducing the vibration to a minimum and the beds have been built to take larger machines when necessary.

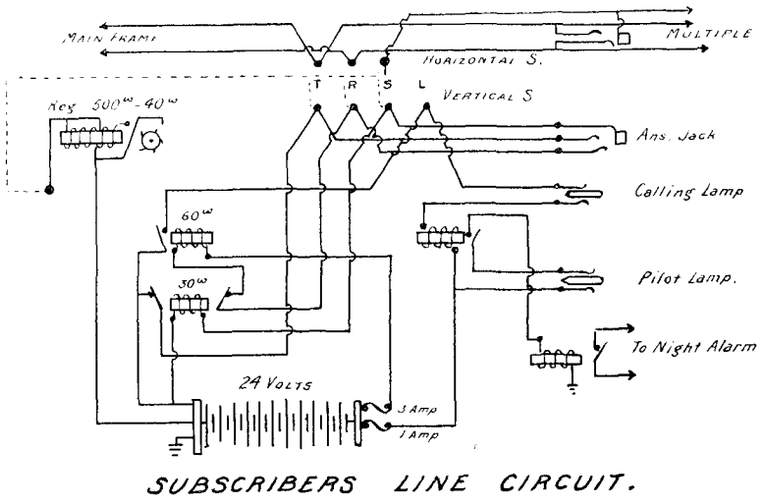


FIG. 4.

The battery consists of E.P.S. accumulators with a capacity of 2,160 ampere hours, at a nine-hour discharge rate, space being left for additional plates to bring them up to 2,970 ampere hours. The tanks are constructed in such a way as to obviate bulging; the actual tank is of very thin metal but is encased in a strong metal frame.

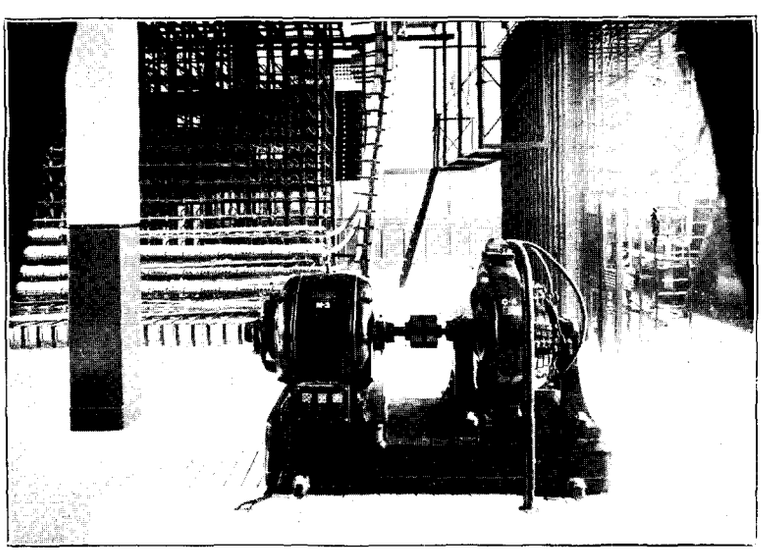


FIG. 5.—APPARATUS ROOM.

The transfer from the old to the new premises, a distance of about 300 yards, took place on May 15 last.

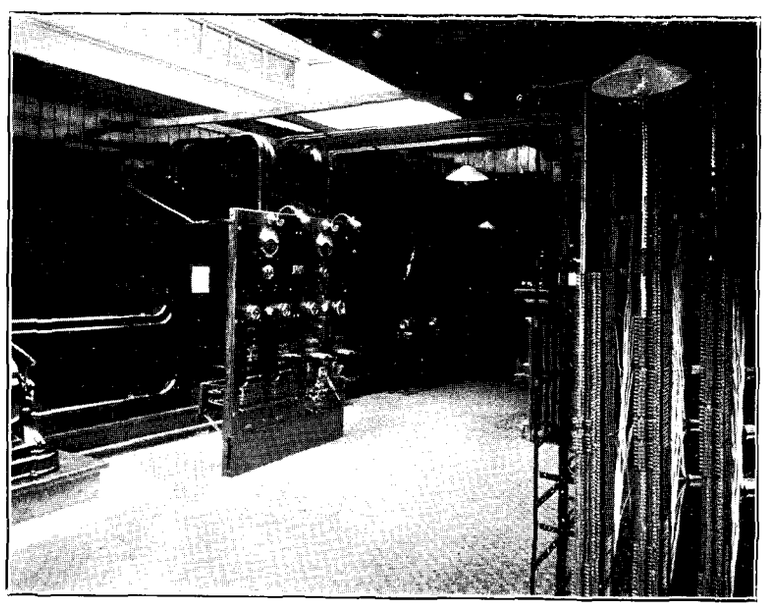
All the tee-connections were made outside on the various routes, and 25 per cent. of the lines were transferred from overhead wires to underground, bringing the percentage of lines underground up to about 80.

The method adopted for cutting over, and which has been successful at other transfers, was carried out in the following way:—At the old exchange tapes were tied to the top heat coil of each arrester bar and the end taken down the rear side of the remaining coils, so that when the tapes were pulled outwards from the bottom they each withdrew 51 coils almost instantaneously. At the new exchange the resting contacts of the cut-off relays were insulated with small wooden wedges which were fastened in sets of ten to a piece of thread, so that by pulling the thread ten lines were connected at the same moment; at a given signal the members of the staff stationed at each exchange commenced disconnecting and connecting, and after the short space of about three minutes every line was working on its new circuit.

II.—GREAT YARMOUTH.

BY J. D. PUGH, *Local Manager*, AND C. H. DAVIDSON, *Chief Inspector, Yarmouth.*

ON March 4 a new central battery equipment of the No. 10 type, in conjunction with a new underground system, was brought into use at Great Yarmouth, in premises lately acquired by the Company in Howard Street South. To adapt the building (which was previously the Devonshire Hotel) to the Company's requirements, structural alterations were necessary.

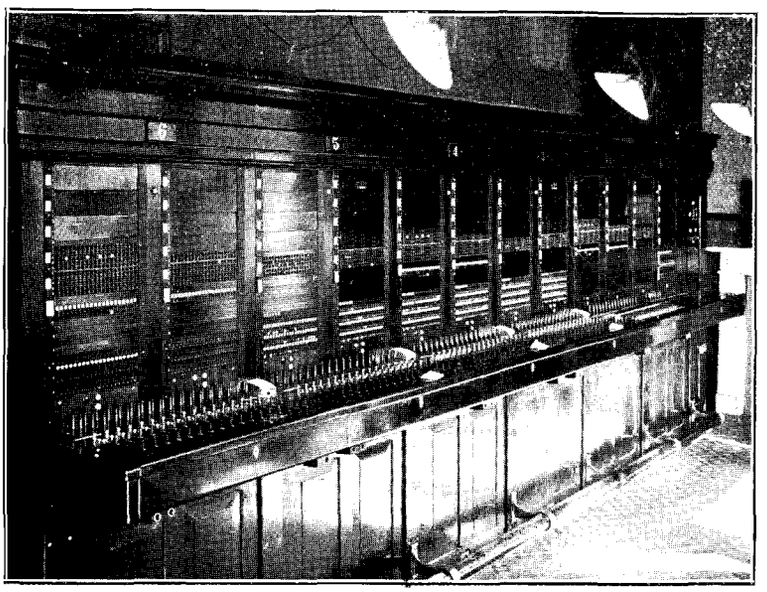


APPARATUS ROOM.

The call offices, general office, local manager's office, battery and apparatus rooms are situated on the ground floor. On the first floor are operators' retiring and dining-rooms, switchroom and caretaker's living room. As this is believed to be the first exchange fitted with this type of central battery equipment it is thought that a few remarks upon it will be interesting to the staff generally.

The No. 10 board presents several peculiarities. There is no special apparatus rack, the relays which in other central battery equipments are fitted on such racks being placed at the rear of the B positions. The line and cut-off relays are not combined, the former being fitted at the rear of the A positions in rows of 30, and the latter above the intermediate distributing frame. The repeaters, which are all of the toroidal pattern, are placed in the

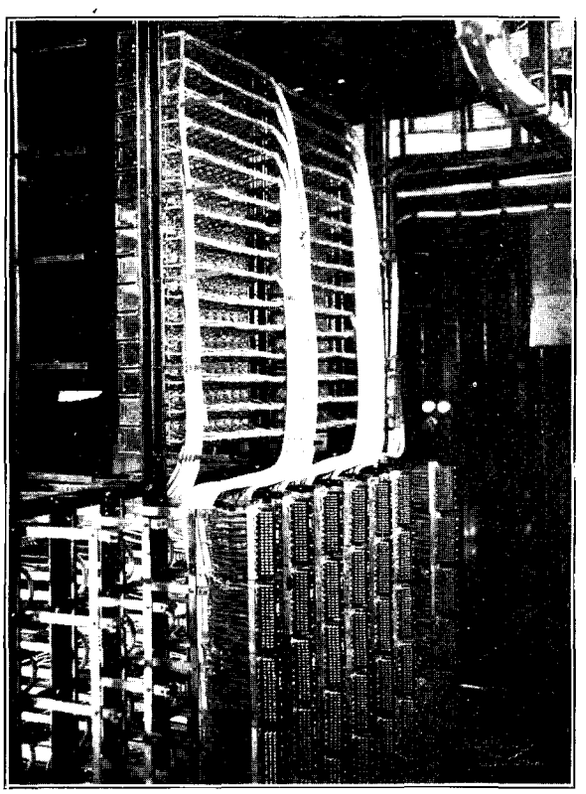
interior of the switchboard at the top. To allow of easy inspection of these, the switchboard sections are fitted with hinged iron covers which can be held up by means of an arm attachment. The alarm fuses for operators' circuits, cord circuits and line relays, are



SWITCHBOARD.

mounted at the rear of the sections, the fuse panel in the apparatus room only serving for private branch exchange and miscellaneous fuses.

The switchboard comprises four A and two B positions.



INTERMEDIATE DISTRIBUTING FRAME (VERTICAL SIDE).

The subscribers' sections are arranged for one position and equipped with seventeen cord circuits. The keys are arranged for two-party ringing and listening with indicator on the same mounting. One B position is equipped with 27 junctions and the other for ten plugging-up cords, the circuits of which are arranged for giving visible or, when a faulty line is cleared, audible and visible signals. (A description will be found in the Correspondence Class books, D Course.) The present equipment of subscribers' multiple jacks is 640 per multiple of four panels, and the capacity of outgoing junction jacks is 40 per multiple of four panels. The calling equipment consists of 600 lamps arranged 80 per panel.

The battery is of the usual chloride type, the eleven cells having a capacity of 82 amperes for nine hours, and the four cells a capacity of 14 amperes for nine hours. One motor generator only has been installed, consisting of a 5-horse-power Wagner induction motor coupled to a standard M type generator, spare armatures for both machines being provided.

Both ringing machines are driven by the battery.

The accompanying photographs show portions of the equipment, that of the intermediate distributing frame showing the method of mounting the cut-off relays.

LONDON NOTES.

WITH the advent of the holiday season there also comes the time of weddings amongst the staff. Four "happy events" have been celebrated recently, and we add our good wishes to those already showered upon the principals. Appropriate presentations were made in each case. Inspector J. Smith, Hammersmith Exchange, received a set of brasses from the Kensington maintenance staff. Mr. W. Little, Senior Test Clerk, North, was presented with table cutlery by Mr. Woollard, Divisional Maintenance Electrician, on behalf of subscribers on the maintenance and operating staffs. The staff in the Rentals Office, Salisbury House, presented Miss Laura Fagg, Fee Clerk, with a clock and pair of ornaments, Mr. Bryson, Chief Rentals Clerk, making the presentation. Mr. M. J. Jennings, Chief Inspector, North-Eastern district, was presented with a handsome brass standard lamp by his colleagues and friends on the staff.

SWIMMING has become one of the recovered arts in these days, when every schoolboy is trained to be an amphibian. In a laudable effort to promote a knowledge of swimming and life saving amongst the staff, the Faraday Swimming Club has been started by some enthusiasts in the Southern district. The new venture deserves success, and, notwithstanding the daily opportunities of water sport afforded gratis by our summer weather, it is to be hoped that a large membership will encourage the promoters. Mr. W. Blight is president, Mr. J. T. Leete secretary, and the headquarters are Laurie Grange Baths, New Cross, on Wednesdays from seven to eight.

THE traffic branch of the London Telephone Society has now appointed its officers. To traffic staff a suffragette agitation has no terrors, as they have proved at many a busy exchange the capabilities and resource of our women. Following out the principle of confidence in the ladies' abilities, they have appointed Miss Minter chairman and Miss K. Hooper secretary of the new branch. A very strong and representative committee has been formed, and arrangements are now in hand for a syllabus of educational and social gatherings to be held during the session.

MR. R. S. WARD, Exchange Manager, Kensington, who organised the staff collection on behalf of Miss Wilson, mentioned in last month's "Notes," has asked me to convey his gratitude to the subscribers for the testimony thus afforded to the kind feeling existing amongst the staff.

THE Metropolitan staff have secured 63 passes in the recent City and Guilds Examinations, 59 of these being in telephony. Out of the latter number 83 per cent. are in the Metropolitan Electrician's Department. The names of those who have received second-class honours are:

J. R. Talbot and W. A. B. K. Ward, Apprentices.
Conrad Fuller, G. Alstrom, W. Barnard, S. J. Batten, W. H. Gibson and J. Pattman, Electrical Department.
H. C. Townsend, Traffic Department.

It is to be hoped that next session even greater advantage will be taken of the unique opportunities to be had in London for technical study. One would like to see the commercial staff better represented on the examination list.

THE Metropolitan construction staff had their annual outing on July 10. A party of 96 journeyed to Polhill, Kent, in special carriages reserved by the South-Eastern and Chatham Railway. In addition to cricket and other amusements a full programme of sports was gone through and greatly interested both competitors and spectators. The chief event was a tug-of-war between the various London construction divisions, Western ultimately defeating City in the final by two pulls to *nil*. At the subsequent smoking concert Mr. G. F. Greenham, Metropolitan Electrician, presided, and presented the prizes to those successful in the sports.

OWING to increased traffic, and the early change-over to common battery of New Cross and Lee Green Exchanges, it has been found necessary to reappoint an exchange manager at New Cross. Mr. A. Ware, formerly Assistant Exchange Manager, East Exchange, has been appointed to the position. The exchanges under his control are New Cross, Lee Green, Woolwich, Erith, Sidcup, Dartford and Bexley Heath.

THE FIRST REPRESENTATIVES OF "TELEPHONE WOMEN" AT THE OFFICERS' MEETING, 1909.

BACK ROW (*reading from left to right*).—MISS RALPH, C.-in-C., Met. Operating School; MISS MACLACHLAN, C.-in-C., Burnley; MISS HALL, C.-in-C., Sunderland; MISS FERGUSON, Travelling Super., Edinboro'; MISS BUTCHER, C.-in-C., London Wall; MISS RICHARDS, C.-in-C., Gerrard; MISS LAW, C.-in-C., Leicester.

FRONT ROW (*reading from left to right*).—MISS HARPER, C.-in-C., Bournemouth; MRS. PETERS, Matron, Glasgow; MISS MINTER, Matron, London. MISS JINKINS, Travelling Super., Plymouth.

THE audit of the Operators' Provident Society accounts for the half-year ending May has just been completed by Messrs. Buckeridge and Baldry, the hon. auditors. During the period dealt with sick benefit has been paid to 343 members, being 30 more than in the corresponding six months of 1908; the amount disbursed (£186 10s. 2d.) is, however, 10 per cent. less. The auditors pay a well-deserved compliment to the secretary, Miss Nicholls, Senior Supervisor, Westminster.

THE papers' committee of the London Telephone Society are at work on next session's syllabus. Members will be pleased to learn that Mr. Hare, Assistant General Superintendent, has consented to give a paper, his subject being "Control." It is hoped that Mr. Hare's may be the opening paper of the new session.

MISS GRIMSDICK, Clerk-in-Charge, Cairo, is at present on leave in this country. She is spending three months of her leave in gaining experience of traffic work in London. Miss Grimsdick has already been through the operating school course, and no doubt she will obtain much information which will be of value to her when the new switchboard now being installed at Cairo by the Telephone Company of Egypt, Limited, is completed.

THE appointment of agents to push the sale of the JOURNAL in the various districts of London seems to have given an impetus to the circulation, the July sales showing an increase of 36 per cent. over the normal.

AN unofficial report of an interesting golf foursome on Shortlands Golf Course, between Head Office and Metropolitan Office representatives, has reached us. The Engineer-in-Chief and the Assistant Engineer-in-Chief worthily sustained the sporting reputation of Head Office, while Salisbury House interests were in the hands of the Assistant Metropolitan Superintendent and the Metropolitan Engineer. Our record of the event tells of various "flukes" and much "bad luck," all, of course, in favour of the winners. We suppress these embellishments, and merely give the eloquent result that Head Offices won by 2 up and 1 to play. We understand that a return match has been arranged, and have promised that if Salisbury House should win the result will be announced in the JOURNAL.

A VERY successful "At Home" was held at Dalston Exchange on June 26 by the Dalston operating staff. Invitations had been sent out to the parents and relatives of the operators, and about 60 of these were present. The visitors were shown over the apparatus room by the exchange manager and some of the maintenance staff, who kindly gave up their Saturday afternoon for the purpose. The honours of the switchroom were done by various stewards selected from the operating staff, and subsequently tea was served in the dining and sitting-rooms. The function was a great success, very few of the visitors ever having seen a telephone exchange before, and consequently displaying a keen interest in all that was shown to them. Particular appreciation was expressed of the arrangements made for the staff when off duty. The idea of interesting the relatives of our operators in their work is a good one, and the Dalston staff is to be congratulated on the success which attended the gathering. J. S.

CORRESPONDENCE.

TEAM WORKING.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I DO not think that there is any advantage to be gained by following any further the various similes which have been adopted, as to do so would merely be to repeat my former arguments, although perhaps in a slightly different form. I am still convinced that these similes prove that, where a number of units are working together in order to achieve a common object, it involves a diminution in the efficiency of the "team" for the units to be in competition with one another as to which of them shall achieve that object first.

I should like, however, to point out that the new simile which was introduced last month, that of a pace-maker, is a point in my favour. Of what use would a pace-maker be if he did his best to beat his friend; his duty is to stay by his friend and help him.

I would also point out that I did not say that the simile of a football team was an "impossible" one; it was originally raised as an argument against competition between the units composing a team and, in the June issue of the JOURNAL, I merely showed that, although a *team* could be compared to an exchange, a *league* could not be so compared, as the conditions are entirely different.

Returning, therefore, to the root matter of this correspondence, the main arguments against competition between divisions of operators are as follows:—

(*a*) The competition is not fair, as the results are based on figures which, owing to team work between divisions, cannot accurately be assigned to the separate divisions. The fairness of the competition is also affected by the unequal loads, different natures of the loads, etc., *which it is beyond the power of the competing units to alter.*

(*b*) In spite of the conscientious endeavours of the supervisors and senior exchange staff, team work between the divisions cannot be carried out to its fullest extent, as no one, naturally, wishes to help those with whom they are competing.

As regards the argument in last month's letter that the system of "one exchange, one team" tends to hide individual weakness, I do not see how this can be so. The division will still exist, under the charge of its supervisor, who will not need the spur of competition to make her try to obtain the very best work possible from each of the individuals under her; indeed, she will be able to spare all the more time for coaching the weaker members of her division, who are probably, owing to calls being "teamed" away from them, handling a less load and therefore having a smaller effect on the service observations for the team than their more expert companions.

The full confidence which, as appears from last month's letter, exists between the exchange manager and the supervisors is, as all will admit, the only way to get the best work done, but I do not see how it is in any way affected by competition between divisions. It is only by arousing their interest in their work and by helping them to fully understand it, that the head of a department is able to obtain proper team work between his staff and himself; no amount of competition, either between operators, between divisions, or between the supervisors and the exchange manager, will produce the same result.

July 16. W. DUFF STEWART.

REPLYING TO THE TELEPHONE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

As one who has felt the great benefit of the introduction in recent times of the system of giving one's name or department immediately on answering a telephone call, I have often wondered why the Company should not make an attempt to extend this benefit beyond the range of its own staff to that of telephone users generally.

I am aware, of course, that whilst it is possible to lay down definite instructions for our own staff, it is a different matter to instruct subscribers. Still, we request the telephone user in our various instruction cards in some cases to speak close to the mouthpiece, to replace receiver only when finished, and in others not to ring back, and so on.

Now, would it not be worth while to extend our advice by a request thus: "In answering telephone please give first your name as appearing in the Telephone Directory."

If such an instruction were adopted it might be worth while issuing a small leaflet briefly explaining the behind thought, and if at first only a percentage of our subscribers were got to answer the calls properly the benefit would soon make itself felt so appreciably that I firmly believe a wholesale conversion would be automatically brought about by time.

I think (although I may be wrong) that this mode of answering has for years existed in Stockholm, and I recollect how careful the late Mr. Peder Hammarskjöld was always, when he came from Sweden to this country, in repeating the style of his firm immediately he answered the telephone.

Then, too, I venture to suggest that if some leaflet were issued it would be well worth while pointing out to busy commercial subscribers the fatal mistake, still so common, of leaving the answering of the telephone to the most feeble member of the staff, probably the youngest office boy.

The following is a case which occurred only a few days ago which illustrates my point, and, from my experience, this sort of thing is most frequently to be met with:—

Response to telephone.—Yes?
Myself.—Is Mr. Russell there?
Response.—Mr. Russell! (In tone of surprise.)
Myself.—Oh, isn't that the Phœnix?
Response.—Yes.
Myself.—Isn't Mr. Russell in?
Response.—Who is that, please?
Myself.—Mr. . . . .
Response.—Mr.—who?
Myself.—. . . (spell name).
Response.—Mr. . . . Oh, Mr. Russell is out of town till Monday.
(Here I replace receiver quickly.)

Contrast this enlivening conversation with what would have taken place if the conditions I am advocating had been in force, and an individual with his wits about him had been in charge of the telephone:—

Response to telephone.—Phœnix.
Myself.—Is Mr. Russell there?
Response.—No, he is out of town till Monday.

Bad attention to a telephone inquiry may do as much harm to a commercial firm as a saucy assistant would do to a shopkeeper's interests—it may tend to send business elsewhere. This is the subscriber's matter, of course, but, as to our own interests, it goes without saying how these must suffer if each conversation is prefaced by a lot of superfluous matter and time is thus wasted on every call.

We take pains to educate our operators, and if we can but educate our subscribers too it must result in their benefit and ours.

Head Office, July 19. P. H. C. PRENTICE.

LONDON NOTES—JUNE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

MR. FENTON'S letter in the July issue makes up in amusement what it lacks in consistency. If Mr. Fenton is so "ready to render any assistance which experience has taught" him, why should he be so supersensitive when it is suggested that others know something which would be of value to him? Really my innocent observation appears to have had upon Mr. Fenton an effect similar to that exercised by recent scare stories of German rifles hidden in City cellars upon certain sections of the Press. Imagination is a valuable possession, but it plays sorry tricks when given the loose rein; Mr. Fenton seems in this instance to have allowed his to run away with him. I suggest that he read the offending paragraph again, and if he does so with an open mind I cannot but think that he will repent at leisure the epistle which he seems to have penned to you with so much haste.

My name and qualifications for which Mr. Fenton clamours so insistently are, I fear, associated with too insignificant a person to carry any weight with Mr. Fenton, even if he had the information, particularly if he is still in the same illogical mood as when he wrote his letter.

May I commend the following extract from a recent Parliamentary debate:—

A: "A sense of humour never has been the right hon. gentleman's strong point."

B: "A joke is a joke"—(Labour member, rudely interrupting: "It is, old man")—"but the right hon. gentleman has gone beyond a joke."

Readers of the JOURNAL can apply the moral to whichever side they please in this entertaining controversy.

London, July 17. J. S.

SEMAPHORE SIGNALLING FOR WIREMEN.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

MIGHT I suggest that wiremen when wishing to convey messages to each other from pole to pole, roof to roof, etc., should adopt the above method of signalling.

Owing to the shortness of the distance over which signalling is necessary the arms could take the place of flags.

It is very easily picked up and, if properly utilised, would be a saving of time to the Company and of lung power to the men.

Midland Exchange, Birmingham, June 26. JAS. CARTER, Test Clerk.

AVENUE CRICKET CLUB.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

WITH reference to the article in the June issue headed "London Notes," owing to a suitable ground not being found until the season was well advanced, it was not deemed necessary to have fixture cards printed.

However, I attach a list of fixtures (with the results of those matches played) which I trust you will find room to insert.

Date.	Opponents.	Ground.	Result.
May 1	Hora's	Honor Oak	Lost
,, 15	Wimbledon Wesleyans	Raynes Park	No play
,, 22	Hora's	Home	Won
,, 29	Early Birds	St. Quintin's Park	Lost
June 5	Darfield	Home	Lost
,, 26	Chaucer	Nunhead	No play
July 3	St. Barnabas	Home	Won
,, 8	Crown Institute	Home	Won
,, 17	Oakdale	Palmers Green	
,, 24	Colls	Home	
,, 31	Crown Institute	Crofton Park	
Aug. 7	Isleworth	Twickenham	
,, 14	Boro' Polytechnic	Red Post Hill, Dulwich	
,, 21	St. Barnabas	Ilford	
,, 28	Early Birds	Home	
Sept. 4	Darfield	Merton Park	
,, 11	Boro' Polytechnic	Home	
,, 18		Home	
,, 25	Colls	Honor Oak	

I might point out that I have room for new members, both honorary and playing, and considering the excellent ground we have obtained there should be no difficulty in getting them.

Our ground is situate in East Dulwich Grove (late Half-Moon Lane), Dulwich, and is easily accessible from the City and West End (two minutes from North Dulwich Station and six minutes from Herne Hill).

We should be glad to see more visitors at our home matches, full particulars of which will be given by

H. J. HENLEY, hon. secretary, Avenue Cricket Club.

Leytonstone, July 14.

THREE TYPICAL RURAL WEST OF ENGLAND EXCHANGES.

CROPTHORNE, NEAR EVESHAM.

TEWKESBURY, GLOUCESTERSHIRE.

BREDON, WORCESTERSHIRE.

NATIONAL TELEPHONE PROGRESS.

DURING the month exchanges have been opened at Prestonpans (Edinburgh district), Kingswear, Devon (Exeter), Much Hadham (Herts and Beds), and Mundesley-on-Sea (Norwich), making a total now working of 1,661. During June 2,851 stations were added, making a grand total of 489,747.

LIVERPOOL.

Bank Exchange.—The new building which has been specially designed and erected to accommodate a central battery exchange is now practically completed, and a start has been made on the installation of a central battery equipment of the No. 1 type for 2,500 lines.

Crosby.—The installation of a central battery equipment of the No. 10 type for 700 lines has been completed and was brought into use on June 24 last.

EDGBASTON.

A start has been made on the new building specially designed to accommodate a central battery exchange, and a central battery equipment of the No. 1 type for 1,000 lines has been placed in order.

STREATHAM.

The new building which has been specially designed and erected to accommodate a central battery exchange is practically completed, and a start has been made with the installation of a central battery equipment of the No. 1 type for 1,730 lines.

GREENOCK.

The installation of a central battery equipment of the No. 10 type for 960 lines has been completed and was brought into use on June 26 last.

MANCHESTER.

Trafford Park.—A start has been made on the new building specially designed to accommodate a central battery exchange, and a central battery equipment of the No. 1 type for 780 lines has been placed on order.

City Exchange.—The installation of a central battery equipment of the No. 1 type for 6,060 lines has been completed, and 4,100 lines have now been transferred to it from Central.

Rusholme.—The installation of a central battery equipment of the No. 10 type for 900 lines has been completed and was brought into use on May 15 last.

Visitors.—Mr. C. F. SISE, of Montreal, President of the Bell Company of Canada, recently paid a visit to Telephone House. He expressed great interest in the equipment and working of the exchanges he viewed whilst in London.

STAFF GATHERINGS AND SPORTS.

Hants and Dorset.—An outing of the Hants and Dorset district staff took place on Saturday, June 26, when members of the staff from the different centres met at Highcliffe-on-Sea to the number of about 100. Most inclement weather prevailed for the greater part of the time. However, indoor games being indulged in, the time passed only too quickly, the staff spending a most enjoyable afternoon notwithstanding the unfavourable elements.

A very happy afternoon was spent on July 17 by the Southampton Instrument and Line Departments on the occasion of their second annual outing. They journeyed by brake to Warsash and partook of a crab tea. After tea a cricket match was played between the two departments, which resulted in a win for the Instrument Department by 30 runs. The party returned about 10 p.m. having thoroughly enjoyed themselves.

Norwich.—The East Coast district staff held their annual outing on Saturday, July 10, when about 40 members of the staff and friends journeyed by brakes to Wroxham and thence by motor launches, *via* the picturesque Broads to Horning Ferry. Following the custom of previous years, a pleasant sports programme was gone through in the afternoon with the following results: *Bowls:* first, H. H. Wigg; second, T. J. Clark; third, V. J. Holloway; special prize, E. Thorns. *Tug of war* (local office trophy): married *v.* single; winners, single. *One hundred and twenty yards three-legged race, scratch:* W. J. Pratt and L. Miles. *Bantam contest:* A. Stroulger. *Threading the needle:* A. G. Suggars. *Long jump:* C. Styles. *High jump:* H. Y. Starkey. An excellent tea was provided at the Swan Hotel, Messrs. H. H. Wigg and T. J. Clark officiating as chairman and vice-chairman respectively. The gathering included representatives from Cambridge, Lowestoft and Yarmouth, who were afforded a warm welcome. Rejoining the motor launches, the party had a delightful run to Wroxham where, after a brief informal smoking concert, the brakes were manned for the homeward journey. The proceedings were favoured by fine weather after a most unpromising morning, and the enjoyment of all was therefore complete. Among the prizes, the cup awarded in the tug-of-war contest aroused special attention and amusement as, acting upon the ingenious suggestion of one of the Cambridge staff, the "cup" consisted of an S. A. cup (standard pattern) and this was suitably mounted with silver bands and placed upon a suitable stand.

Durham District.—On June 26 the Durham district staff visited Newcastle-on-Tyne. A match in the Chambers Cricket Challenge Cup competition was played against the Newcastle district team, the result being a victory for the visitors by ten wickets. The team and friends were afterwards kindly entertained to tea by the Newcastle staff.

Manchester.—The second of a series of bowling matches arranged between the Contract Department and the District Office was played at the Hesketh Arms Hotel, Cheadle Hulme, on June 19. A lively contest resulted in a win for the District Office by 43 points. A smoking concert followed at which Messrs. Crompton and Richards were at the piano, and the vocalists were Messrs. Sheard, Taylor, Richards, Hewitt, Burke and Harris. Mr. Elliott was in the chair. A hearty vote of thanks to Mr. Harris and the committee terminated a very enjoyable outing.

Gloucester.—A most successful staff picnic was held in this district on July 3 when the staff who, together with friends, numbered nearly 60, drove to Birdlip on the Cotswold Hills. An excellent repast was provided in the picturesque grounds of the Royal George Hotel, at the conclusion of which Mr. C. Elliott, District Manager, on behalf of the staff, presented Mr. A. E. Ryland, who has been transferred to Cardiff, with a clock. The evening was spent in various games, including a cricket match and bowls, while some of the members preferred to "view the scenery" *à deux*. A reluctant start for home was made about 9.30 p.m. The staff are greatly indebted to Mr. C. Elliott and

Mr. Thompson (organising secretary) for the success of the outing, which it is hoped will be repeated before the end of the season.

Edinburgh.—About 40 of the Edinburgh district staff engaged in a ramble on Saturday, June 19. The route chosen was from Balerno Station across the Pentland Hills by way of Bavelaw and Loganlea (where tea was taken picnic fashion) and Bonaly Hill to Colinton. The very enjoyable afternoon led to arrangements being made for a similar outing on July 31.

Ampere Golf Club.—After a close and hard game Messrs. J. D. W. Stewart and A. F. Dunn defeated Messrs. H. V. Main and C. McFarlane in the final of the 18-hole foursome competition.

Maidstone. — *Swimming.*—The employees of the Company and the Post Office telegraphists met at Maidstone baths on the morning of July 1 to contest a team race (120 yards). An exciting finish was witnessed, the "National" winning by about two and a half yards. The winning team was as follows:—C. W. Fisher, F. Oliver and S. Waghorn (district office) and C. Baldey (Chief Inspector).

Tunbridge Wells. — An enjoyable gathering took place on Saturday, July 3, at Tunbridge Wells, excellent weather prevailing, when the staff entertained the Hastings and Eastbourne staffs. A cricket match was played on the St. John's Cricket Ground, and resulted in favour of the home side. The visitors batted first and were dismissed for 27 runs, Tunbridge Wells replying with 56. The catering arrangements were ably carried out on the field by the ladies of the staff, under the management of Miss Bishop. There were about 80 members of the staff present, among whom were Mr. Armstrong, Mr. R. Curling and Mr. A. L. Curling, Local Managers of Hastings, Eastbourne and Tunbridge Wells respectively.

Nottingham Factory. — The annual outing of the Sundry Instruments Repair Department took place on Saturday, June 26, to Hemington. Notwithstanding the dull aspect of the weather during the early part of the week, the party were favoured with fine weather on the day of the outing. Sports were arranged, including flat, three-legged and wheelbarrow races, in addition to a miniature football contest. The sports were very keenly contested, to the great satisfaction of the onlookers. An ample meat tea was provided, after which Mr. Chadwick presented the prizes to the winners of the various events. Altogether, the outing proved to be most enjoyable, and it was not without regret that the party had to return to Nottingham.

Hamilton.—The Mid-Lanark staff held their annual picnic on Saturday, July 3. The party, numbering about 50, left in brakes for Calderwood Glen, a drive of about nine miles. The weather, unfortunately, was very broken, but on the whole the party enjoyed their outing and hope to repeat the venture at an early date.

Luton.—On July 3 about 70 members of the staff with their friends journeyed by brake to Ayot, a picturesque village in Herefordshire, where the annual picnic was held. The usual games were played; and of the sports which were held tugs of war between the various departments were the most interesting items. The weather was fine, and an enjoyable time was spent.

Pontypridd.—An outing of the Pontypridd local staff took place on Saturday, July 17, when between 30 and 40 members and friends from the centre journeyed to Barry Island. Sports were arranged and friendly competitions took place. After an enjoyable tea a hearty vote of thanks was accorded the committee, and everyone present agreed that the outing had been a success. The weather was fine though a trifle cold.

NEWS OF THE STAFF.

Mr. J. SINCLAIR TERRAS, District Manager, Reading, has been promoted to be Engineer for Birmingham. Mr. Terras entered the service in November, 1889, was made Local Manager at Galashiels in February, 1893, and District Manager in the same place in 1895. In February, 1896, he was transferred to Greenock, and in July, 1904, to his present position.

Mr. R. GILMOUR, District Manager, Belfast, has been transferred to the district managership of Edinburgh. He entered the service in December, 1881, since when he has been successively Local Manager, Aberdeen; District Manager, Dundee, 1893; and District Manager, Belfast, since February, 1896.

Mr. J. D. WATSON STEWART, District Manager, Edinburgh, has been transferred to Belfast in a similar capacity. Mr. Stewart entered the service in July, 1886, since when he has been Local Manager for Ayrshire; District Manager, Mid-Lanark (1893); District Manager, Greenock (May, 1895); District Manager, Aberdeen (July, 1896); and District Manager, Edinburgh (1904).

Mr. A. MACLEAN, District Manager, Birkenhead, has been transferred in a similar capacity to Reading. Mr. Maclean entered the service in May, 1883, and has been successively Local Manager at Liverpool and Birkenhead, and District Manager at the latter place since August, 1899.

The Birkenhead district will be merged in Liverpool under the control of Mr. E. J. HIDDEN. Mr. Hidden has been in the service since March, 1886. In 1894 he was made Assistant Engineer for No. 2 Division, London, Chief Electrician for the City in 1896, and was transferred as District Manager to Liverpool on Jan. 1, 1900. Mr. C. S. WOLSTENHOLME will be Engineer for the combined districts, and Mr. E. C. FRANCIS, Electrician, Liverpool, will be the Traffic Manager. Mr. A. ROBERTS, Local Manager, Bootle, has been appointed Electrician, Liverpool.

Mr. S. G. C. BALDWIN, Engineer, Birmingham, has been promoted to be Assistant Engineer, London. He entered the service as Draughtsman in Sheffield in 1896, was made Engineering Inspector in the same town in June, 1899, and transferred as Engineer to Birmingham in October, 1906.

Mr. A. M. WATT, Cost Clerk, Cashier and Outstandings Clerk, Glasgow, who entered the service in January, 1899, has been appointed to Head Office audit staff as from June 4, 1909.

Mr. F. H. LANGDON DAVIES, Local Manager, Bedford, was presented by the Bedford staff, on the occasion of his transfer to Maidenhead, with an oak salad bowl and servers, suitably engraved. He also received an address signed by the Mayor, Deputy-Mayor, Medical Officer of Health, Borough Electrical Engineer and other prominent subscribers, testifying as to efficient service given under his management at Bedford.

Mr. T. C. RHODES, late Local Manager, Maidenhead, on the occasion of his transfer to Bedford, was presented with a handsome tea set, suitably engraved, by the staffs of the Maidenhead and Windsor centres. He was also handed a short illuminated address, bearing the signatures of the 51 subscribers to the presentation.

Mr. STARK, Caretaker, and Misses JANE and JANET STARK, Operators, Galashiels Exchange, were presented by the members of the Border staff with a pipe in case, gold locket chain and gold bangle respectively, on the occasion of their leaving for British Columbia. The presentation was made by Mr. H. G. McFarlane, District Manager. The Misses Stark have also been the recipients of a cheque, value £33, and various small gifts from the Galashiels subscribers.

Miss LILIAN DUDLEY has been promoted to be Senior Operator at Henley-on-Thames, vice Miss H. Gould.

Miss MARY HADLEY, Supervisor, Midland Exchange, Birmingham, has been made Travelling Supervisor for the district.

Miss WINIFREDE HINDLE, Supervisor, Bradford, has been promoted to be Travelling Supervisor for the West Yorkshire district.

Mr. A. E. MOORE, Inspector, Bournemouth, has been transferred to Dublin.

Mr. W. HAYNES, Chief Inspector, Wigan, has been promoted to a position on the Dublin electrical staff and on leaving the Wigan centre was presented by the staff with a travelling rug and fountain pen. A most suitable speech was made on the occasion by Mr. Beattie, the Local Manager, and the presents handed to him by Miss H. A. Jones.

Miss ALICE N. WHYTE, Chief Operator, Gorbals Exchange, has been appointed Clerk-in-Charge of that exchange.

Mr. JAMES WARNOCK, jun., on the occasion of his appointment as Local Manager, Peterhead, was presented by the engineering and electrical staff with a silver cigarette case.

Mr. W. T. N. BUTLER has been appointed Contract Agent in Altrincham, where a new exchange, equipped for 1,100 subscribers, has been opened. Old North-Western Province men will remember Mr. Butler as having been connected with the telephone service in these parts for many years.

Mr. W. SIM, Engineer, Exeter, has secured a first-class certificate for telegraphy and second-class for telephony; and Mr. C. R. PARKHOUSE, Inspector, Exeter, has secured second-class certificate for telegraphy and second-class for telephony at the recent sitting of the City and Guilds' Examination, held at Exeter.

Mr. H. REID has been successful in obtaining a first-class certificate for telegraphy and first-class certificate for telephony at the recent City and Guilds' Examination, held at Exeter.

Mr. P. W. HUMPHRISS, Chief Inspector, Exeter, has been appointed Electrician for the district.

Mr. W. HIGSON, Instrument Inspector, has been appointed Exchange Manager-in-Training, Dublin.

Misses A. MCLAUGHLIN and E. WILSON, Senior Operators, Dublin, have been promoted to Supervisors' positions, Central Exchange.

Miss GRACE CHITHAM has been appointed Travelling Supervisor for the Leicester district.

Mr. H. Y. STARKEY, Engineer, Yarmouth, has passed in the honours grade, second class, in the recent examination in telephony, and Mr. D. V. WILTON, Inspector, in the ordinary grade, first class.

Mr. J. D. PIERREPONT, Sub-Engineer, Nottingham, has resigned the service in order to take up the position of Assistant Manager for the Oriental Telephone Company, Singapore.

Mr. G. H. HATTON, Faultsman, Dover, who is a member of the Dover Wheelers' Cycling Club, recently attempted a 24 hours' unpaced Kentish roads record. He proposed to ride 294 miles in 24 hours, but completed that distance fourteen and a half minutes inside schedule time.

Mr. R. MORGAN, Exchange Manager, Dublin, has been appointed Traffic Manager for the Dublin district.

Mr. W. FINLAY, Exchange Manager, Belfast, has been appointed Traffic Manager for the Ulster district.

Mr. M. E. CONNOR, Chief Inspector, Dublin, has been appointed Electrician.

Mr. G. KIRKWOOD, Engineer-in-Chief's switchboard staff, has been transferred to Dublin centre as Exchange Inspector.

Mr. E. JONES, P. O. Fee Clerk, Belfast, has been promoted to be Cashier.

Mr. H. COPE, of the General Superintendent's Office, on his transfer to the Metropolitan staff as Call Office Collector, was presented with a case of pipes, pouch and silver match-box.

Miss NORA LOWE, Operator, left Burnley to take up a similar duty at Sheffield as from July 23. Before leaving the staff presented her with a ring as a memento.

Mr. C. V. Shorthouse, Draughtsman, Birmingham, has been transferred to Battersea.

Mr. H. G. Peck, Foreman of Exchange Construction Staff, has been appointed Exchange Electrician, East (London).

London Traffic Department.—*Promotions and Transfers:*

Mr. ALBERT WARE, Assistant Exchange Manager, East, has been promoted to be Exchange Manager of the New Cross district.

Mr. JOHN WEBB, Exchange Inspector, London Wall, has been promoted to Assistant Exchange Manager, London Wall.

Miss HARRIETT HAYWARD, Operator, Holborn, has been made Operator-in-Charge at Waltham Cross.

Miss ETHEL ORME, Operator, Avenue, has been made Operator-in-Charge, Loughton,

Miss ETHEL EVERARD, Operator, London Wall, promoted to be Supervisor, East.

Miss ETHEL BRAND, Operator, Avenue, to be Supervisor, Bank.

Miss ETHEL KEEN, Operator, Bank, to be Supervisor, North.

Miss LILY COLEMAN, Operator, Bank, to be Supervisor, Avenue.

Miss P. WILD, Operator, Deptford, on being transferred to Sydenham in a similar capacity was presented by the Deptford staff with a gold locket.

MARRIAGES.

Miss AMY JONES, Clerk, Birkenhead district office, resigned on July 1 to be married, and was presented on leaving with a travelling bag and cake knife. The presentation was made on behalf of the staff by Mr. A. Maclean, District Manager.

Mr. P. MURRAY, of the Head Office audit staff was married on July 17 to Miss FLORENCE DAWSON, Correspondence Clerk, Birkenhead district office. Prior to leaving, Miss Dawson was presented by the staff with a silver-backed brush, comb and mirror, and a cake stand. Mr. Maclean, District Manager, in making the presentation, expressed the good wishes of the staff.

Mr. A. F. BEAL, Local Clerk at Bournemouth, was married on June 7, and was presented by the staff with a handsome case of cutlery. The presentation was made by the Local Manager.

Mr. J. H. WATKINS, of the Engineer-in-Chief's Office, was the recipient of a handsome marble clock from his colleagues on the Engineer-in-Chief's staff, on the occasion of his marriage to Miss AGNES TROTT, of the Brighton staff, which took place on July 17.

Mr. J. H. MARSHALL, Storekeeper at Whyte Place Line Stores, Edinburgh, was married on June 11. He was presented with a marble clock, subscribed for by the staffs who frequent these stores.

Mr. L. G. COSH, Chief Inspector, Guildford, was presented by the Guildford staff with a handsome marble clock on the occasion of his marriage to Miss May Wild, of Southampton, which took place on June 2. The presentation was made by Mr. S. F. Letty, Local Manager, in the presence of the staff, who expressed every good wish for the future happiness of Mr. Cosh and his bride,

Miss A. M. SNELSON, Operator, Warrington, who resigned on July 1, after ten years' service, in view of her approaching marriage, was presented by the district office and operating staffs with an antique designed electro-plated tea set. The presentation was made by Mr. H. Chambers, the District Manager, who commented upon the efficient manner in which Miss Snelson had always carried out her duties.

Mr. N. C. BILTON, Chief Inspector, Eastbourne, was on the occasion of his marriage presented with a Gladstone bag, subscribed for by the staff. The presentation was made by the Local Manager, Mr. R. Curling.

Miss ADA M. STEAD, Operator, Pontypool, resigned on June 26 as she is about to be married.

Miss LILY ETHEL BOTTOM left the Company's service on June 24 to be married. She entered the service on Dec. 15, 1899, and has been in charge of the Erdington Exchange for the last eight years. The staff of branch exchanges presented her with a dinner cruet, and the staff of the sub-exchanges with a teapot.

Miss LILY LEWIS, Supervisor at Central Exchange, Birmingham, left the Company's service on June 17 to be married. She had been in the service nearly thirteen years. She was the recipient of many presents from individual members of the staff, and in addition, as an expression of the high esteem in which she was held, she was presented with a dinner service by the operators at Central Exchange and silver *serviette* rings from those at Midland.

Miss HELEN HARMAN, Operator, Ramsgate, on leaving the Company's service to be married, was presented by her colleagues with a silver cruet stand.

Miss HILDA FANNY GOULD Senior Operator, Henley-on-Thames, has resigned in order to be married.

Miss IVY BLUNDELL, Junior Operator, Royal Exchange, Liverpool, resigned on June 24 to be married. She was presented with a toilet service, trinket set and rose bowl by the Royal operating staff.

London Traffic Department.—*Resigning to be Married:*

Miss ADA BAILEY on resigning from London Wall was presented with a salad bowl and servers by the operating staff.

Miss KATHLEEN DYER on leaving the same exchange was presented with a gold brooch.

Miss ROSE ALMOND, who resigned in June from Lee Green, was recently presented with a tea service by the staff.

Miss MAUD ROMAIN on resigning from East Ham, on July 8, was presented with a brass fire screen by the staff of the East District.

Miss DAISY HUCKEN resigned from Bromley on account of her approaching marriage on June 24. The Bromley traffic, engineering and maintenance staffs combined to present her with a copper kettle and stand and some white china flower stands. The Exchange Manager, Croydon, went to Bromley, on July 7, with the purpose of personally presenting the articles on behalf of the staff, when the sad news was received of the sudden death, that day, of Miss Hucken's brother and the matter had therefore to be postponed and the gift forwarded privately. In offering good wishes for her future happiness, her colleagues had to add their sincere condolences in Miss Hucken's bereavement.

Miss ALICE LAWRENCE on leaving Kensington Exchange in view of her approaching marriage, was presented with a tea service.

OBITUARY.

Mr. THOMAS GRIFFITHS, Inspector, Cardiff, died on June 27 at the Cardiff Infirmary from pneumonia, at the age of 33. An operation was performed, from the effects of which, however, he unfortunately did not recover. Inspector Griffiths entered the Company's service at Cardiff on June 5, 1902, and by his death a valuable servant has been lost to the Company. His loss will be keenly felt by his colleagues, with whom he was deservedly popular. He leaves a widow and four young children.

On June 11 Wireman ELLIS, Halifax, died in the Halifax St. Luke's Hospital, after some fourteen years' service with the Company, commencing as Firepot Boy. He served in the South African War as a volunteer. As a workman he was of a conscientious nature, and at social functions was a great favourite. He was highly respected, and a wreath was subscribed for by all grades of the staff, who were also represented at the interment. His age was 32, and he leaves a widow.

We regret to record the death, on June 5, of Mr. A. Jackson, Leading hand, Kensington.

THE EDUCATION OF THE PEOPLE.

BY W. A. VALENTINE, *District Manager, Glasgow.*

AT the recent Officer's Meeting in London a serious proposal was put forward that special officers of experience should be engaged to devote their whole time to the work of educating subscribers in the part they play in the matter of telephone service. This novel proposal has many attractive features, and one recognises that at the present time such an officer would have a long furrow to hoe.

It has been recognised that the less the subscriber has to do the better it will be for the service; this has doubtless weighed with the Company's expert advisers when considering technical policy, and under the central battery system which is being gradually introduced in its exchanges the part to be played by the subscriber has been reduced to a minimum. The opposite conditions must give rise to difficulty in automatic systems, where the switching operation has to be performed by the originator of the call.

Notwithstanding the introduction of the central battery system into the exchanges of this country, with the consequent lessened responsibility of the public, there is still great need for education. One of the best methods of getting subscribers interested is to arrange for their visiting an up-to-date switchroom. It is difficult to get a clear idea of what a subscriber expects to see in a switchroom, but it is invariably the experience that the actual is very much at variance with the expected.

In forms of expression much is still left to be desired. If subscribers answered their telephones promptly, and generally carried out the rules so carefully compiled for their guidance, how much the service would be improved!

To appoint special officers for the purpose of educating the subscribers is a somewhat costly method, and meantime a great deal can be done by the existing organisation. The education should begin early, and much responsibility rests with the body of officers who fit the instruments and who first get into touch with the exchange from the new subscriber's premises. No doubt at this stage eager eyes watch the fitter's every movement and the methods he adopts in calling the operator's attention, while the expressions he uses are carefully noted.

After the fitter, a foreman calls to see that the apparatus has been properly fixed, and he has thus an opportunity of early correcting any error in the method or the expressions used by the subscriber. From time to time, too, an instrument inspector in making his regular inspections or in clearing faults has his opportunity of tactfully putting the subscriber right if he notices any irregularities. What is specially required is that every officer of the Company should see carefully that he invariably carries out the rules himself, thus setting the right example to the subscriber.

At the last session of the Officers' Meeting the chairman expressed satisfaction at the results obtained during recent years through the education of the Company's officers, especially those of the Traffic Department, who are more closely related to the public in the hour-to-hour telephone service; and it is interesting to find that even in the way of spelling out telephone numbers subscribers are adopting the method used by the operators. The electrician here has issued a communication to his staff in connection with the general question, from which good is expected.

We have heard a good deal lately of "What the public wants," and public demand will more quickly be satisfied when the public realise that they themselves are important factors in the supply of an efficient telephone service.

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TELEPHONE MEN.

XL.—CHARLES HENRY SIBLEY.

THE subject of our sketch this month, Charles Henry Sibley, who is a native of Bristol, entered the service of The Telephone Company in 1879 as an operator.

The completion of 30 years' continuous service in the telephone industry is an event which, while perhaps not unique, is still sufficiently noteworthy to warrant attention being drawn to it.

Mr. Sibley's earliest experience was in the working of the first Bell switchboard installed in this country, and after spending a short period in the mechanics' shop, he was sent to make himself acquainted with the Edison boards which were then in use at the Cornhill and Queen Victoria Street Exchanges. He was subsequently promoted to the position of Clerk-in-Charge at the Leadenhall House and Smithfield Exchanges, and he also took charge of the Company's exchange plant at the Fisheries Exhibition in 1883. Desiring a change after this he spent about nine months in Birmingham on instrument work and assisted in fitting up the switchboard in the exchange then situated in Bennett's Hill.

He gained his first knowledge of outside construction work in London and the South of England, after which, accepting a position in the north as Engineering Inspector under Mr. Clay, he obtained a sound practical training in what then might safely be termed the most up-to-date telephone plant in the country. After assisting in converting the subscribers' circuits and exchange apparatus from single to metallic circuit in Middlesborough, he had charge of the erection of the trunk circuits between Durham, Bishop-Auckland, Darlington, Stockton and Hartlepool. He had also charge of the construction of the first main trunk to Leeds as far as Northallerton.

In November, 1888, Mr. Sibley was appointed Manager of the Durham district (including the towns north of Newcastle as far as Berwick-on-Tweed), the first telephone line in the old Border town being erected under his supervision. The line in question was run between Messrs. Darling & Company's offices in Berwick to their works in Spittal, and it was carried over the old Border Bridge by means of a cable. This circuit is believed to be the first actually brought into use between England and Scotland.

In February, 1892, Mr. Sibley was transferred to the Sheffield district, taking charge of the Chesterfield and Rotherham centres. In May, 1893, he was appointed Local Manager at Sheffield, and at the close of the competition with the Sheffield Telephone Exchange and Electric Light Company assisted in amalgamating all the existing exchanges into what is known to-day as the Central Exchange.

He was next appointed District Manager for the Potteries, under his present chief, Mr. Alfred Coleman, and drew up a report on the working of the call wire system then in use in that district, recommending certain modifications and the centralisation of Tunstall, Burslem, Stoke-on-Trent and Hanley into the handsome building erected specially by the Company in Etruria Road, in the last-named town. These recommendations, along with an extensive underground system, were adopted, the work in connection with which was greatly facilitated by the enlightened view on the telephone service held by the local authorities, all of whom granted the necessary wayleaves.

While stationed at Hanley, Mr. Sibley also undertook, in the absence of his colleague, Mr. L. H. Lowe, the supervision of the work in connection with laying the ducts for the Llandudno

underground system, obtaining the necessary consent from the Urban District Council.

In September, 1899, he was appointed District Manager of the new Leicester district, and went through the entire process of constructing a new exchange and converting a single to metallic circuit system. At this time the town was in the throes of a powerful agitation on the part of the Corporation in favour of municipal telephones. How the agitation was met and finally dropped would take more space to tell than can be spared. The Corporation, in view of the experience subsequently gained at Glasgow and other towns, are to be congratulated on having so wisely withdrawn their opposition and entered into an amicable arrangement with the Company.

In January, 1904, Mr. Sibley was transferred to Dublin, and during the three and a half years he was stationed in Ireland he carried out many important works—several of the exchanges being remodelled. In June, 1907, on leaving Dublin to take up the appointment of District Manager at Nottingham, a district which stretches from the Peak of Derbyshire on the one side to the Wash on the other, he was presented with a handsomely illuminated address by the members of the staff. Among the many problems he was called upon to deal with at once were the extension of the Nottingham premises to provide additional office and switchroom accommodation, the extension of the Nottingham common battery switchboard and the reorganisation of the power plant and test-rooms, all of which works are now completed and bring Nottingham into line with the most up-to-date exchanges in the kingdom. During his control underground schemes have been completed in Nottingham, Derby, Lincoln, Newark, Ilkeston and Long Eaton, and sub-exchanges have been opened at Radcliffe, Draycott, Daybrook, Bingham, Alvaston and Mickleover.

He was elected a member of the central committee of the Staff Transfer Association and provincial representative for the Midlands in April last.

Mr. Sibley has proved himself a tactful manager, and has shone in dealing with wayleave and other difficulties in which landowners, factors, town councillors, committees and other official bodies require careful handling. Few men are his superiors in obtaining any required facilities or in smoothing over difficulties. The collapse of the agitation for municipal telephones in Leicester, already referred to, was largely due to him. He is firm and just in his dealings with his staff, takes a great interest in telephone society work and in any associations of a social nature connected with the staff, and is deservedly popular.

THE TRANSFER OF DALSTON EXCHANGE TO THE CENTRAL BATTERY SYSTEM FROM A TRAFFIC POINT OF VIEW.

BY J. A. JENKINS.

THE transfer of this exchange from the old premises at Colvestone Crescent to the new central battery switchboard at Kingsland Green took place on Saturday, May 15. A brief description, from a traffic point of view, both of the change-over and of some of the preparations incidental to it may perhaps prove of interest to the readers of the JOURNAL. The present equipment consists of eighteen "A" and twelve "B" positions, having an existing capacity of 2,100 lines with 240 outgoing and 216 incoming junctions. A standard central battery type clerk-in-charge's desk and a two position monitors' table are also fitted. The "A" positions include the testing and electrophone positions, both of which are equipped with the very latest pattern apparatus, and also the new service board, Dalston 101, on which lines from the Engineers, Stores, Contract and Workshop Departments situated in the building terminate. A feature of the internal arrangement of the exchange building is the convenient position of the operators' quarters, which are on the same floor as the switchroom and consist of dining, sitting and rest rooms, a kitchen and operators' locker room.

Probably the most important work preliminary to the transfer was the distribution of the subscribers' lines on the new switchboard. In connection with this records were taken at the old exchange and the day, night and Sunday traffic on each line determined. The calls were then brought to local value and the distribution list compiled in such a manner that, whilst the load on each position was equalised as much as possible, night and Sunday callers were concentrated on one end of the board so that their traffic might be easily handled by a small staff. Multiple and position cards were prepared and also cards for the subscribers' numerical list and for the registers. On the Wednesday before the opening of the new exchange, the distribution having been completed, the number plates and opal markings of the local sections were checked from the multiple by means of circuit plugs and also checked with the position cards. A start was then made on pegging the multiple, and this was completed on Thursday, when both the peg and auxilary marking were checked. By Friday all checking had been carried out, and the lines between the various desks and between the desks and the "A" positions spoken over and found to be in order.

The whole of the operating staff had received three weeks' practical central battery tuition at North Exchange, one operator being specially trained for the testing position. During the week prior to the opening they were brought over to the new exchange in groups, and the board was thoroughly explained to them, together with the method of operating the clerk-in-charge and monitors' desks and the electrophone position. Each operator was also given her instrument so that she might adjust the headgear and her particular requirements, and when this had been done, the instruments were at once put away in their owner's lockers.

A point was also made of getting those subscribers who had large installations worked by their own staff to allow their operators to visit the exchange, and the knowledge gained by the latter from this visit undoubtedly prevented much trouble after the transfer.

The change-over had been arranged to take place at 1.30 p.m., and ten minutes before this time those operators who were to be on duty were marshalled in the dining-room. All had been previously told what positions they were to occupy and the order in which they should enter the switchroom. At 1.30 p.m. the prearranged signal was given and the operators filed into the exchange in pairs, going direct and without confusion to their positions. The maintenance staff at once began disconnecting the lines from the old exchange and connecting them into the new, and within a few minutes the operators were busy dealing with calls. As soon as the traffic would permit all line lamps were tested by means of short circuit plugs and the faults found entered on specially ruled forms which were handed to the maintenance staff as soon as completed. A list of special subscribers' lines had also been prepared, and these lines were tested at the earliest possible moment, arrangements having been made to deal at once with any found to be out of order.

The total number of faults found to exist after the transfer was very low, the permanent glows also averaging 23, or 1·50 per cent. during each half-hour of the afternoon, a figure which I should think compares favourably with that arising at other transfers. It is also gratifying to note that on the day of the change-over not one complaint of bad service was received. The transfer was eminently successful from the Traffic Department's point of view, a matter on which the operating staff are to be warmly congratulated. Congratulations are also due to the engineering and maintenance staffs, both for the small number of faults reported and for the speedy manner in which those found were cleared up.

NATIONAL TELEPHONE PROGRESS.

A NEW exchange has been opened at Woolverstone (Suffolk) in the Ipswich district, and the total now working is 1,561. The net increase of stations during July was 1,749 making a total of 491,496.

Altrincham.—The installation of a central battery No. 1 equipment for 1,100 lines in a new building specially designed has been completed. The equipment was brought into use on July, 24.

Bromley.—The installation of a central battery No. 1 equipment for 1,500 lines in a new building specially designed has been completed. The equipment was brought into use on Aug. 14.

THE IMPEDANCE OF TELEPHONIC APPARATUS.

BY B. S. COHEN, *Engineer-in-Chief's Investigation Department.*

A CONVENTION that is firmly rooted in telephonic practice is that of designating apparatus by its ohmic resistance.

A reference to the Company's Stock List will show that the description of a piece of electrical apparatus usually includes its ohmic resistance, which usage has established to refer to its direct current resistance. These ohmic resistance values are of course required for determining the signalling current, but from a little consideration it will be obvious that such figures give no indication of the practical or telephonic behaviour of the apparatus in question.

For example, under "coils retardation" in the Stock List will be found coils of 600 ohms, 500 + 500 ohms and 70 ohms. Now it is found in practice that the coil with an ohmic resistance of 70 ohms causes, when bridged across a line, no more loss by shunting the telephone current than the coil of 1,000 ohms resistance.

The factor which determines the shunting effect of a piece of apparatus bridged across a telephone line, and the cutting down caused by inserting the apparatus in series in the line, is the impedance, and this factor is made up of three components: inductance, effective resistance and capacity, each of which depends on a number of other factors, the more important of which are enumerated below:

(*a*) The dimensions, shape and number of turns of the coil winding.

(*b*) The nature, dimensions and subdivision of the material forming the core.

Owing to the complexity of the problem and the absence of sufficient data it is impossible to calculate or forecast, except very approximately, the impedance of any piece of apparatus possessing an iron core.

As the impedance of most telephonic apparatus will vary with the frequency, wave form and amplitude of the current applied, it is necessary to make the measurement of such apparatus either with actual telephonic speech current or with a good imitation.

For various reasons it has not so far been found possible to make satisfactory measurements using actual speech currents. Researches, however, have shown that a sinusoidal wave form of 1,000 ~ and current amplitude between the limits of about 0·3 and 2 milliamperes, gives results closely approximating to the truth. By the aid of such a current and the apparatus to be described, which includes the inductometer, on which an article appeared in the April number of this JOURNAL by Mr. G. M. B. Shepherd, values for the effective resistance, inductance and impedance of telephonic apparatus can be easily and rapidly obtained.

The complete set of apparatus used in the Investigation Laboratory at Head Office consists of

(*a*) A sine wave alternator provided with an automatic governor which keeps the speed and consequently the frequency constant, this operates by centrifugal force. A wave filter of special construction is inserted in the alternator circuit in order to purify the wave.

(*b*) A bridge circuit, arranged as shown in the figure, is made up of the inductometer A, a special dial resistance box B, a pair of equal ratio resistance arms C and an ordinary telephone receiver D.

The dial resistance box B is of a special pattern built to the design of this department by Mr. R. W. Paul. It has four dials, viz., units, tens, hundreds and thousands.

The 1,000 ohms resistances are made of fine woven resistances of the type devised by Mr. Duddell. This material consists of a cloth with a silk warp and a fine resistance wire woof, and has the property of possessing extremely minute inductance and capacity. Resistances formed of this material are consequently truly non-inductive even at very high frequencies, and this is more than can be said for the everyday pattern of resistance box, which is usually inaccurate at any frequency approaching 1,000 ~.

The lower resistance coils in this box are built on a method devised by Mr. A. Campbell, of the National Physical Laboratory, and called by him the hurdle method. On this method, instead of winding the resistance wire in one coil, it is subdivided into a number of small doubly wound coils, spaced at equal intervals on a wooden rod, the capacity effects being thereby lessened. This resistance box gives a range from 1 to 11,110 ohms, and is sufficiently accurate at frequencies at least as high as 2,000 ~.

Now turning to results. The following table gives the effective resistance, inductance and impedance of the most generally used apparatus:—

Effective Resistance, Inductance and Impedance of Standard Apparatus at 1,000 ~.

Apparatus.	S.L. No.	Effective resistance. Ohms.	Inductance. Henries.	Impedance. Ohms	Impedance. Angle.	Loss in milliwatts per 1 volt.
Bells.						
1,000ω magneto ...	6	7,580	1·305	11,140	47° 9′	·061
Indicators.						
1,000ω tubular, ordinary	10	8,000	1·2	11,000	43° 24′	·066
Do. do. differential	11	20,200	·224	20,300	5° 0′	·049
600ω self-restoring	5	8,055	1·3	11,410	44° 55′	·062
100ω + 100ω eyeball signal, unoperated		3,900	0·512	4,035	14° 45′	·240
100ω + 100ω eyeball signal, operated		4,300	0·539	4,440	14° 3′	·219
Instruments.						
Local battery subscribers, battery key up	1	434	0·189	1,265	69° 57′	·027
Do. do. down	1	563	0·182	1,275	63° 48′	·035
Receivers.						
Double pole bell (60ω central battery)	10	134	0·182	176	40° 24′	4·33
Relays.						
500ω double make and break. (W.E.) armature not attracted	9	7,160	1·157	10,210	44° 54′	·069
Do. do., attracted	9	7,960	1·238	11,150	44° 24′	·064
1,000ω do. do., not attracted	11	9,910	1·543	13,845	44° 18′	·052
Do. do., attracted	11	9,970	1·617	14,230	45° 30′	·049
Retards.						
100ω tubular ...		1,116	0·191	1,640	47° 6′	·414
200ω ,, ...		3,170	0·550	4,690	47° 30′	·144
400ω ,, ...	5	4,700	0·664	6,280	41° 30′	·119
600ω ,, ...	1	5,906	0·890	8,132	43° 20′	·089
1,000ω ,, differential	2	19,100	0·538	19,400	10° 0′	·051
75ω + 75ω W.E. pattern, No. 2020A		1,827	1·367	8,770	77° 58′	·024
200ω + 200ω W.E. toroidal, No. 44B	–	3,600	13·5	85,000	87° 34′	·0005
No. 1, Central Battery Termination (consisting of repeater, supervisory relay, local line and subscriber's instrument).						
(*a*) No. 25 repeater, local line, 0ω	–	330	0·049	451	42° 57′	1·62
(*b*) Do. do. 300ω (ohmic)		630	0·068	760	33° 54′	1·09
(*c*) Do. do. 3-m. 20-lb. cable		689	0·049	746	23° 51′	1·22

Note.—To obtain loss in milliwatts at any voltage V, multiply figures in last column by V^2.

The figures in the last column but one are the true impedance values in ohms, together with the angles of these values. The

angle depends on the ratio of the effective resistance to the reactance. Written mathematically, this angle is such that its tangent

$$= \frac{p\,L}{R}$$

Where p is the frequency multiplied by 2π
L is the inductance and
R the effective resistance.

Then if the effective resistance were so large that the reactance became negligible, the angle would be 0°.

If the reverse were the case, the angle would be 90°, and equal values for R and p L would make the angle 45°. The energy lost in any of the apparatus in watts would be

$$= \frac{E^2}{Z} \cos.\ \theta$$

Where E is the alternating potential
Z the impedance
θ the angle.

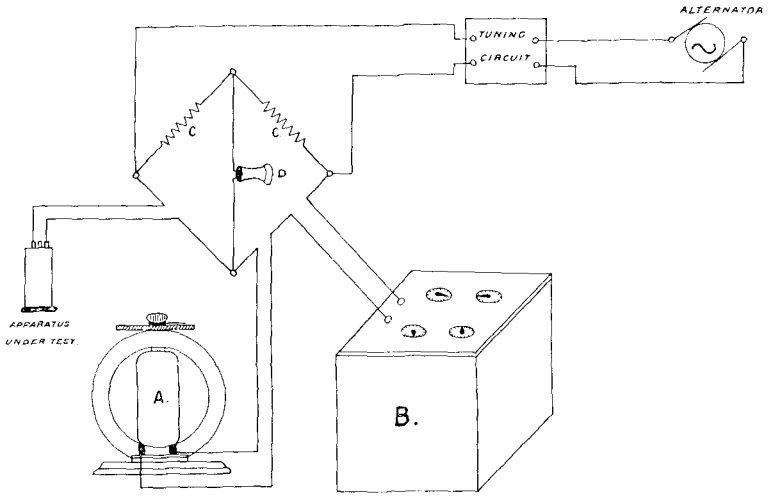
For example, in the case of the $75\omega + 75\omega$ retard, the energy lost, assuming the applied potential is 5 volts, would be

$$\frac{5^2}{8770} \cos.\ 77^\circ\ 58' = \frac{25}{8770} \times \cdot209 = \cdot000596 = \cdot596 \text{ milliwatt.}$$

Whilst in the case of the $1{,}000\omega$ tubular differential indicator, the energy lost under the same condition would be

$$\frac{5^2}{20300} \cos.\ 5^\circ\ 0' = \frac{25}{20300} \times \cdot996 = \cdot00123 = 1\cdot23 \text{ milliwatts.}$$

A loss of over twice as much as in the case of the retard, which is entirely caused by the smaller angle, as the impedance value is higher in the latter case.



Attention may be drawn to one or two interesting points in this table. A 200-ohm eyeball signal has an effective resistance of 3,900 ohms and an inductance of ·512 henry when unoperated. Directly the eyeball shows, the magnetic circuit is altered and the effective resistance increases by 400 ohms and the inductance by ·027 henry.

The local battery subscriber's instrument, which has an ohmic resistance on the line side of 145 ohms, has an effective resistance of 434 ohms when the primary circuit is open, and this increases to 563 ohms when the primary circuit is closed. Assuming speech waves of 1,000 ~ and 5 volts potential difference, the loss when the battery key is up is only 6·7 milliwatts against 8·6 milliwatts when the key is depressed. The inductance on the other hand decreases from ·189 to ·182 henry. There is consequently a double advantage to be gained by leaving the battery key up whilst receiving, viz., improved reception due to increased volume received owing to the lower impedance and to the elimination of side tone and disturbances caused by the transmitter.

In the case of relays, the result of attracting the armature to the poles is to increase both the effective resistance and the inductance. Thus from the transmission point of view solely, a500-ohm double make and break relay bridged across a junction line and used for operating a clearing signal would be more efficient if the clear were operated by the break contact then if it were operated by the make contact, as in the former case the armature would be attracted and the impedance augmented by about 1,000 ohms during conversation. The impedance of a central battery instrument and local circuit, including a toroidal repeater connected up for junction working, *i.e.*, on a "B" position, varies from 451 to 760 ohms according to the local line, and the average value is under half that for the local battery instrument. This explains the fact that the transmission losses due to a certain piece of apparatus inserted in a line terminated by local battery instruments may be different to the loss occasioned by the same apparatus on a similar line but terminated by central battery instruments.

The impedance of the terminating instruments is also an important factor in the design of loaded lines.

It is needless to add that without data for the impedance of telephonic instruments, it is impossible to make any transmission calculations with which to confirm practical results.

An important and interesting fact has been brought to light in connection with the impedance measurement of differentially wound apparatus such as 1,000-ohm retards and indicators S.L. Nos. 2 and 11. The inductance of differential wound coils is under a quarter that of non-differential coils and the effective resistance of the former is over double that of the latter. This curious result is due to the effect of the capacity which exists between the two differential windings. The capacity in the case of a 1,000-ohm indicator amounts to as much as ·064 microfarad.

If the half of a 1,000-ohm differential retard were used to bridge a telephone line the result would be curious, as under these conditions the effective resistance amounts to 6,500 ohms, the inductance is *nil*, being entirely neutralised by the capacity, and in consequence the impedance is 6,500 ohms $\angle 0^\circ$. If however the half-winding which is not in use were disconnected at the centre tab the capacity effect no longer exists and the inductance immediately becomes ·54 henry, the effective resistance 3,630 ohms, and the impedance 4,970 ohms $\angle 43^\circ\ 0'$.

It would appear that the tremendous increase in effective resistance when the capacity effect is present is due to loss of energy caused by losses in the dielectric. Curiously enough, the loss in speech current due to the half-retard in either of the above conditions is about the same. Assuming that the speech potential is 5 volts the loss is approximately 3·8 milliwatts.

THE COMPANY'S CORRESPONDENCE CLASSES, 1908-9.

WE give below a circular letter which was issued during August by the Engineer-in-Chief, containing a report on the working and results of these classes for the past session, excluding only the references to certificates and schedules, which accompanied the circular.

CORRESPONDENCE CLASSES, 1908-9.

Number of Members.—The number of members of the classes has slightly decreased, the total for the session being 2,859, as against 3,034 in the previous one, a decrease of 5·7 per cent.

The membership in the various courses has varied as under, in comparison with the previous session:—

	Increase.	Decrease.
Course "A" ...	—	27·4 per cent.
" "B" ...	2·1 per cent.	—
" "C" ...	—	7·8 per cent.
" "D" ...	46·9 per cent.	—
" "M" ...	—	11·6 per cent.
" "N" ...	32·8 per cent.	—

Certificates.—The number of members obtaining certificates this session is 909, as compared with 860 for session 1907-8, an increase of 49 or 5·7 per cent.

This increase is very satisfactory in view of the decrease in the nnmber of members. Reference to Schedule G will show that the percentage of members qualifying maintains the increase referred to last session, 50 per cent. of the members who answered obtaining certificates.

Percentage of Answer Papers Received.—There is again a steady

improvement to record in this respect, and although the number still falls off considerably as the session advances, it will be seen from the curves that there is a satisfactory and well-maintained increase in the percentage.

Percentage of Marks Obtained.—This is again greatly improved in comparison with previous sessions, and taken in conjunction with the increased number of certificates issued, indicated that the quality of the work done by the members is increasingly good.

Member with the Highest Results.—A. E. Sutherland, a member of the testing staff of this department at Nottingham Factory has obtained the following percentages:—

In the "A" Course	...	97·9 per cent.
" "B" "	...	97·3 "
" "C" "	...	97·8 "
" "D" "	...	98·5 "
" "M" "	...	100·0 "
" "N" "	...	99·1 "

Other members, notably Mr. Schofield, of Hanley, have also done exceedingly well.

Women Members.—There has been a considerable increase in the number of women students, 98 entering this session as against 65 in the previous one. Of this number 56, or 57·1 per cent., have gained certificates, this comparing with twenty or 30·8 per cent. doing so last session. These results are considered very creditable.

Next Session.—The session 1909-10 is due to commence in September next; full details will be issued in due course.

First five places obtained by members in each of the various courses (except in "M" and "N" Courses, where, owing to reasons of space, only two places are given):—

			Percentage.
"A" COURSE.			
1st place	Sutherland, A. E.	Head Office	97·9
2nd "	Dowell, J.	Leicester	95·8
3rd "	Brown, A.	Leicester	94·2
4th "	Douglas, J. H.	Edinburgh	93·7
	Sturges, A.	Met. Stores Dept.	93·7
5th "	Thompson, E. J.	Luton	93·1
"B" COURSE.			
1st place	Carroll, H. B.	Liverpool	100·0
2nd "	Schofield, T. H.	Hanley	98·4
3rd "	Keer, R. K.	Manchester	97·3
	Sutherland, A. E.	Head Office	97·3
4th "	Hutchison, J.	Glasgow	96·8
5th "	Hollings, G. A.	Met. Electns. Dept.	96·3
"C" COURSE.			
1st place	Hague, E. L.	Leicester	97·8
	Sutherland, A. E.	Head Office	97·8
2nd "	Parry, J.	Liverpool	97·1
	Schofield, T. H.	Hanley	97·1
3rd "	Abbott, A. C.	Met. Electns. Dept.	93·5
4th "	Tugwell, P. C.	Maidstone	92·1
5th "	Hutcheon, A.	Aberdeen	91·4
"D" COURSE.			
1st place	Keer, R. K.	Manchester	98·5
	Rumley, B. C. H.	Bristol	98·5
	Sutherland, A. E.	Head Office	98·5
2nd "	Goulden, W.	Head Office	96·4
	McMeeking, J. L.	Glasgow	96·4
	Schofield, T. H.	Hanley	96·4
	Stewart, W.	Glasgow	96·4
	Whittle, J. C.	Birkenhead	96·4
3rd "	Davey, J.	Birkenhead	94·3
	Haveron, T.	Glasgow	94·3
4th "	Baillies, D. C.	Glasgow	93·6
	Bishop, H. G.	Head Office	93·6
5th "	Pope, G.	Coventry	92·1
"M" COURSE (two places only).			
1st place	Grieve, T.	Glasgow	100·0
	Sutherland, A. E.	Head Office	100·0
2nd "	Brightmore, A. E.	Sheffield	99·7
	Jarvie, J.	Glasgow	99·7
	Morrice, A.	Dundee	99·7
	Scott, R.	Dundee	99·7
	Taylor, F. C.	Met. Electns. Dept.	99·7
	Thompson, C. H.	Norwich	99·7
	Thompson, E. J.	Luton	99·7
"N" COURSE (two places only).			
1st place	Dunkerley, H. W.	Oldham	100·0
	Hague, E. L.	Leicester	100·0
	Schofield, T. H.	Hanley	100·0
2nd "	Baker, C. P.	Liverpool	99·7
	Boyd, R.	Glasgow	99·7
	Brown, C.	Liverpool	99·7
	Eaton, H.	Liverpool	99·7
	Watkin, H.	Hanley	99·7

THE REGISTER CLERK.

BY R. NETHERWAY.

HE had just been promoted to the dignity of a register clerk, and the sole control of fifteen ledgers seemed to him a task which must bring his best points to light. For a fortnight things went swimmingly; he had not fallen into any of those dark pitfalls which are strewn somewhat plentifully in the register clerk's path; his cash had balanced without any trouble, and, moreover, there were no outstanding works orders; small wonder that he felt elated with his new post. But the third week came the "frost." He had been passing a wet evening pleasantly at bridge and had just brought off a *grand slam* in "No trumps," when in the hour of his triumph, through some inexplicable means, there flashed across his brain the knowledge of the existence of a book which had the letters "R.I.A."* plainly marked on the cover thereof. This book he remembered he had not looked at since he "took over" from his predecessor, and he inwardly cursed his folly. He played very indifferent bridge for the remainder of the evening, and under plea of having a wretched headache retired early to uneasy slumber. Remember that he had not been a register clerk long.

Of course the R.I.A. book was dipped into very early and very eagerly in the morning. There were three items not cleared, two removal charges and one rental. The former were all right; but the rental, £7 15*s.* 6*d.*, had been paid—a rare occurrence by the way—by a subscriber with a curious Hebraic name, and one to whom our newly appointed register clerk distinctly remembered sending a final notice more than a week ago. Further investigation proved that the service had been withdrawn on the previous day, and now, of course, the subscriber would write in, claim damages, and there would be the very deuce of a row.

A register clerk always looks upon subscribers as his natural enemies, and here was a case which proved that this one at least could only be looked upon as such. He must have received the notices sent, but had preserved a studied silence and doubtless was waiting until the service was withdrawn to turn round and demand the due date being advanced at the very least. So reasoned the newly appointed.

He was, however, well up in the *modus operandi* of dealing with such cases, and accordingly he had the service restored, not only with a view to righting a wrong, but also in order that he might speak to the subscriber and endeavour to pacify him and so save further bother.

Some subscribers are quite tractable, whilst others . . .

During the day he made several futile attempts to speak with the subscriber, but on each occasion the operator assured him that she could get no reply. Being of a somewhat determined nature he resolved to call upon the subscriber that evening on his way home, and accordingly at six or thereabouts he was ringing the door bell, at the same time murmuring a carefully rehearsed apology. No answer being received he rang again and was about to do so for a third time when a voice hailed him from the street: "Hi! you there, young feller, it's no good you ringing like that, them people are away for their summer 'olliday and won't be back till next week. Been gone for more'n a month." Turning round the newly appointed beheld one of the "limbs of the law," who had doubtless been asked to keep an eye on the house during the owner's absence. He thanked the officer for his information and murmuring that the weather was decidedly warm and thirsty withal, left that astonished worthy with a shilling in his hand and a doubt in his mind as to whether the sun had not been more than usually effective that day.

With regard to the notices which will be received by the subscriber when he returns from his holiday, well, I've no doubt but that he can be persuaded to destroy them, but even if he does not and insists upon airing his grievance, things will not be nearly so bad as they might have been.

* Rentals in advance.

THE TELEPHONE STATIONS OF THE WORLD.

By W. H. GUNSTON.

(*Continued from page 97.*)

ASIA.

THE telephonic development of Asia presents nothing remarkable. At present, with the exception of Japan (which contains three-quarters of the telephones in Asia), it is confined to those countries where Europeans have settled or rule. These remarks may not hold good for many years more, as China, Persia and other native states are commencing the establishment of telephone systems. It has not been thought necessary to show the proportion of telephones to population as in the case of Europe, as the few thousand stations which serve the hundreds of millions in China, India and Japan would yield a figure of little significance.

India.—The Oriental, the Bengal, and the Bombay Telephone Companies had at the beginning of 1909, 4,630 connections in Bombay, Ahmedabad, Karachi, Calcutta, Madras, Rangoon and Moulmein. The Telegraph Department of the Indian Government maintains 3,573 stations, but it is to be observed that the Government telephones, with few exceptions, are not available to the public for the transmission of paid message traffic. There are thus altogether 8,203 stations in India. Ten years ago there were 2,889.

In *Ceylon* (State system) there were 641 stations at the beginning of 1909, of which 615 were in Colombo.

In Singapore, *Straits Settlements*, there were 1,005 telephones in the Oriental Company's system at Jan. 1 last.

Dutch East Indies.—The telephone here is partly in the hands of the State, and partly in the hands of eighteen private companies. At the beginning of 1908 the former had 3,905 stations, and the latter 2,513. There are probably now 7,000 telephones in these colonies. Ten years ago there were 4,833.

Cochin China, Cambodia (French Indo-China).—At the beginning of 1898 there were 235 stations here, and in 1908, 681.

China.—The Chinese Government have recently let a contract to the Western Electric Company for equipment for the establishment of a telephone service in Pekin. The Shanghai Mutual Company have a number of stations working approximating 5,000.

The China and Japan Telephone Company possess 925 telephone stations in Hong Kong and Kowloon.

Japan (State ownership).—The recent extension of telephony in Japan has been somewhat rapid. At the beginning of 1908 there were 52,153 telephones in operation, and in 1909 71,430, whilst 46,678 more were in course of construction. The following are the principal systems:—

	In operation.	In course of construction.
Tokio	18,589	10,406
Osaka	7,576	8,080

In addition the State systems in *Formosa* in 1898 served 1,767 stations, in Japanese *Sakhalin* 150, and in *Corea* 3,350. Ten years ago there were only 8,177 stations in Japan.

Russia in Asia.—Exchanges exist in Siberia, in Central Asia and south of the Caucasus, but the number of stations are included in the grand total for the Russian Empire and shown under Europe. Tiflis, Irkutsk and Baku have each over 1,000 stations.

Summary of Asia.

	Jan., 1908.	Jan., 1909.
India	7,477	8,203
Ceylon	518	641
Singapore	—	1,005
Dutch East Indies	6,418	7,000*
French Indo-China	681	710*
Japan	52,153	71,430
Formosa, Japanese Saghalin ...	1,910	2,400*
Corea	3,350	4,000*
China (Shanghai and Hong Kong)	—	5,000*
Russia in Asia (included under Europe)	—	—
Total		100,389

* Estimated.

Persia.—The telephone has been established on a small scale in Teheran, but recent political troubles and the agitated state of the country are hardly likely to facilitate its development at the present.

Afghanistan.—As mentioned in the JOURNAL recently, a line from Jellahad to Herat is almost completed, but no information is to hand as to the number of stations—probably very small—in work.

AFRICA.

The telephonic development of this continent is, as might be expected, and as in the case of Asia, almost entirely confined to European colonies or European-ruled countries.

Egypt.—The Telephone Company of Egypt have exchanges in Alexandria, Assiout, Cairo, Port Said, Mansourah, Zagazig, Tantah, Suez and Fayoum, with 7,025 stations in all at the present time.

Algeria.—The French Government administer the telephone service in this country, which at the beginning of the year comprised 4,261 stations, of which 1,370 were in the town of Algiers and 624 in Oran.

Tunis.—At the beginning of 1908 the French Government had 1,144 telephones working in this country. Ten years ago there were only 216, and there are now probably 1,300.

Ethiopia (Abyssinia).—This native State has a regular system of governmental trunk lines, but the telephone stations consist chiefly of call offices at the principal towns and railway stations. (See JOURNAL for December, 1907.)

Portuguese Africa, Madagascar and *Senegal* only muster a few hundred subscribers' stations between them, not more than 500.

Cape Colony (Government).—The number of telephone stations in the colony at the beginning of this year was 4,560, of which 2,289 were in Cape Town and district. In 1902 there were only 1,577 stations.

Transvaal.—The total number of telephones worked by the Transvaal Post Office was 4,344 on Jan. 1 last. Of these 3,009 were in Johannesburg and 688 in Pretoria.

Orange River Colony.—The Post Office have 532 telephones working, of which 460 are in Bloemfontein.

Natal.—At the beginning of 1908 there were 2,246 stations in Natal, 1,164 belonging to the Government, and 1,082 to a municipality. The total may be now computed at 2,300. Ten years ago there were under 300.

Summary of Africa.

	Stations, 1909.
Egypt	7,025
Algeria	4,261
Tunis	1,300*
Cape Colony	4,560
Transvaal	4,344
Orange River Colony	532
Natal	2,300*
Total (with allowance for Ethiopia, Senegal, Madagascar, Rhodesia, and German and Portuguese Colonies)	25,000

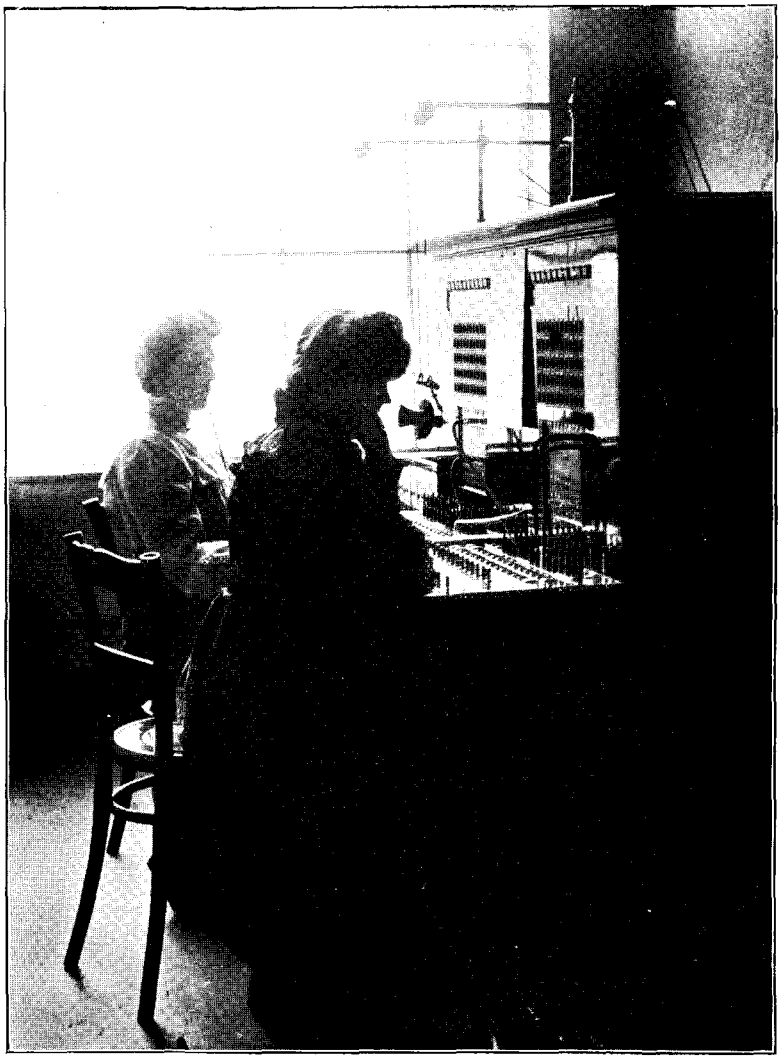
(*To be continued.*)

PRIVATE BRANCH EXCHANGE CONSTRUCTION.

By E. L. PRESTON, *Local Manager, Bristol.*

A FEW particulars respecting the installing of a private branch exchange on a rather larger scale than is usual for the West of England may prove interesting. An order at the measured rate was obtained from Messrs. Mardon, Son & Hall, printers and lithographers (a branch of the Imperial Tobacco Company, Limited)), for four junctions, and between 80 and 90 extensions, internal and external, to various offices in their six factories at Temple Gate, Bristol. The scheme called for unusual attention. A careful study was made as to the future development, and also as to the best method of carrying out the work.

Covered distribution was decided upon, this being much more favourable than open wires. Altogether, nine distributing points were established, and great care was exercised in fixing these to see that the minimum of inside wiring was necessary. Aerial dry-core lead-covered cables were used throughout, and, as will be seen by the plan below, a covered system was provided direct from the underground distributing point, thereby reducing the inconvenience caused by faults to which open wires are prone to a minimum. The cables in many cases could have been clipped to the walls; but owing to the possibility of early deterioration of the lead armour (due to the collection of dirt, etc., between the cables and the wall) this practice was not indulged in, but the following method was adopted:—The cables were placed on suspenders.



which were kept well clear of the wall, down pipes and other obstructions, by means of specially made eyespikes, (12 inches, 14 inches and 16 inches long, fixed about five yards apart, which were made off on wall plates at the extreme ends of the buildings. This, of course, kept the cables parallel to the coping (there being practically no sag), and there was the additional advantage of facilitating the periodic inspection of the cables, which is essential.

I believe it has been said that cables about buildings would be objected to; but quite the contrary has been our experience, and, in this case, comments have been made as to the neat appearance of the cables, especially at the point where they enter the switchroom at No. 6 Factory.

The switchboards are of the standard floor pattern. Two (No. 20 in the Company's stock list) were fitted side by side. These provide for central battery working, the power for which was supplied by means of three pairs of wires from the Company's Central Exchange. This is much more satisfactory than providing batteries at the subscriber's premises. Owing to the Company's not stocking a suitable protector frame, one had to be designed and made locally. This was fitted by the side of the switchboards.

On the day of opening, the power wires, four junctions and 81 extensions were brought into use. The remaining stations were joined up at a later date, as certain building alterations were necessary.

On five of the stations automatic boxes have been fitted, which may be used by any member of the firm's staff who may desire to use the exchange service for private business.

The operating is carried out by two of the Company's staff who have had several years' experience at the Bristol Central Exchange. They are therefore thoroughly acquainted with the very latest methods of dealing with traffic. In this respect Messrs. Mardon, Son & Hall are in a unique position as regards private branch exchange operating in Bristol, and they are more than pleased. Prior to the installation of the Company's private branch exchange, the firm had a private installation. Comparisons, they say, are odious, but they cannot help drawing the line here; for, whereas they knew what a *telephone* was, now they know what a *telephone service* is. This is really a great advantage, for, if the subscribers had not the private installation before, they would have taken our expert private branch service for granted—just what we *ought* to give, and so on; whereas now! well, as I said before, comparisons are odious—but not, in this case, to the Company.

Messrs. Mardon, Son & Hall have done all that is possible, to facilitate matters. For instance, they have printed a card giving a list of the numbers of the various instruments. One of these is fixed in the switchroom and at each instrument, and is a help both to the operators and to the users of the telephones.

This brings the total of private branch exchanges now working in the Bristol Centre to 113, of which 71 are at the measured rate.

We have now another order from the Imperial Tobacco Company, Limited, for a large private branch exchange, with seven junctions and 109 extensions at W. D. & H. O. Wills' Factory, Bedminster.

SWANSEA EXAMINATIONS.

THE following certificates have been gained by members of the Swansea staff:—

City and Guilds Examination,—Telephony:

Mr. C. G. Heighton, first-class honours.
Mr. A. G. Bristow, ordinary grade.
Mr. F. Tagholm, „ „
Mr. D. E. Wilson, „ „

Board of Education:

Mathematics, stage II, Mr. A. G. Bristow.
Electricity and magnetism, elementary, Mr. D. J. Morgan.
„ „ „ Mr. C. B. Payne.

MYSTERY OF A TELEPHONE POLE.

(NOT BY FERGUS HUME).

THE serenity of Grasmere has this week been disturbed by an event which at one time bore all the outward and visible signs of a blood-thirsty sensation. The whole mischief arose over the simple erection of a telephone pole. The gardener of the estate (Forest Side) upon which it was proposed to erect the pole, appeared to regard this invasion of his domain as little short of a violation of sanctity, and he strongly demurred at the excavation being made on the particular spot chosen by the workmen. After a good deal of protestation on the one side and interrogation on the other, a compromise was effected, the canny Scot undertaking to dig the hole himself whilst the men went to their dinner. As one of the latter was departing he observed the gardener draw from the hole a suspicious looking bag which with consummate haste he re-interred in another part of the grounds. The witness's fears were aroused—either this was a case of a daring robbery or a cold-blooded murder. One young fellow, constituting himself an amateur detective, quickly went for the assistance of the police, and it was resolved to surround the place and prevent the perpetrator of this crime from escaping from the scene of his diabolical perpetrations. Meanwhile the alarm spread through the village that a dead body had been unearthed on the hillside, and soon a large crowd would have assembled. However, quickly closing on their quarry, the pursuers somewhat surprised this stoical individual by their mysterious actions, climbing over walls, hiding behind trees, etc. Enquiring if there was a hunt on, he was speedily requested to unearth the object he had hidden. For a time he blankly refused, but pressure being brought to bear, he commenced digging, and amidst a scene of unprecedented excitement compared to which the Druce case sinks into insignificance, the gardener ultimately exhumed the dead body—that of a black cur dog.—*Lakes Herald.*

SOME NOTES ON THE PERIODIC INSPECTION OF TOOLS.

By J. McMEEKING, *Glasgow.*

A FEW months ago a periodic inspection of all tools used by the Company's employees was introduced. This was found necessary for various reasons, chiefly because it was recognised that, no matter how competent a workman might be, if he had not good tools to work with he could not possibly produce good work, and also that a great deal of money was lost by the Company and in some cases even life was endangered through using tools which were really unfit for use. Prior to this inspection a half-yearly stocktaking was carried out, but this was looked upon more as a means of checking and balancing actual stock than anything else. Very little attention was paid to the condition the tools were in, or how many each foreman had against him. The result was that some foremen had a good number of excess tools out and others had not really enough to do the work with economically. The condition of the tools in some cases was not very satisfactory.

The object of this three-monthly inspection is, therefore, to see that the men have a sufficient number of good and serviceable tools to perform their work with and that a sufficient stock of tools is kept in the stores in good condition to meet the demand; to condemn *all* tools which are unfit for use and have them scrapped immediately; and to keep a permanent record of each inspection, so that if at any time it is necessary to look up a man's record in connection with his tools it can easily be done. This inspection is carried out by visiting the gangs at their work where the tools are examined and checked. This saves interruption of the work in progress which would be caused by bringing tools into the stores. The storekeeper has a tool book for each man and in it is entered up a list of all tools against him. It is essential that these books be kept accurately and thoroughly up to date and every transaction immediately recorded therein, otherwise discrepancies occur which cause no end of trouble.

The advantage of this periodic inspection are obvious. It ensures greater uniformity in the number of tools held by the gangs—in fact most of the gangs in certain districts have standard kits now. It prevents excess tools accumulating. It improves the tone of the work done, as the tools are in better condition. It also ensures that tools given out from the stores are in good condition.

There are just a few points in connection with the tools which foremen ought to observe:—

1. It is absolutely essential that each foreman should have a full kit of tools under his care in order to avoid borrowing, and also that the work upon which he is engaged should not suffer from his not being fully equipped with all the necessary tools.

2. Excess tools should be avoided as they only add weight to the barrow when shifting about and are really an encumbrance instead of an advantage, besides increasing the man's responsibility. They are also just so much dead stock, and if they were in the store they could be put to more profitable use, and possibly the number of tools put on requisition might be thereby reduced.

3. Tools taken out on loan from the stores should be returned immediately they are finished with. Such tools are only given out for one week, and, if they are required for a longer period, a renewal of the loan slip is necessary. This fact is sometimes overlooked, and the result is that someone is given unnecessary work in looking into the matter.

4. Two of the primary points in connection with tools are to see that they are kept clean and that sharp tools are replaced by good ones when they get blunt. This changing of sharp tools is an important point. A foreman may have his men working away with blunt tools, and taking double the time to do the work that would be occupied if sharp tools were employed. You can see how seriously this affects the interests of such a large Company as ours. Incidentally it will be very much to each foreman's advantage, as well as the Company's, to observe this point, as a foreman who habitually shows on his record that he is keeping unclean and blunt tools cannot hope to be classed a competent man. It is not necessary to wait until the inspection to get tools changed. These changes should be effected whenever necessary.

5. Care should be taken to see that the tools are not abused and that they are used only for the purpose they are intended for.

6. Unnecessary material should be avoided on the barrow as it does not improve its appearance; besides, it takes up valuable room, which could be utilised with more advantage to the tools.

There is one point which I might mention and it is—if a suitable and safe place could be got for a small rental for storing the barrows over-night in each district it would be more satisfactory for the foremen. As it is they have to seek the hospitality of some benevolent contractor and are liable to be told at any time to make themselves scarce. A good deal of trouble is experienced and time lost in finding a place sometimes, and I feel sure if this point were conceded that, from the foreman's standpoint, it would be a great benefit.

In conclusion, I would just remark that since this inspection has been started a satisfactory improvement has been observed in the condition of the tools, and very little trouble may be looked for at these inspections in future.

POLE ERECTION IN LEICESTER.

By A. W. GARRARD, *Engineering Inspector.*

THE accompanying illustrations, which will explain themselves, may be of interest to those readers of the JOURNAL who do not spend their Sundays on work of this nature.

A 60-feet pole was to be erected in a yard in a congested part of the town. In order to comply with the owner's conditions and to avoid stopping the traffic, the work was carried out on Sunday,

FIG. 1.

May 2. Four derricks were required, one 50-feet (which itself had to be erected on a 36-feet derrick) in the street, and two 40-feet in the yard in question. The arrangement of these is shown in Fig. 1, the three poles being in line thereby rendering the guying more simple. The third working derrick (in the foreground) was necessary in order to clear the projecting beams seen on the left.

The pole hole is behind the heap of earth and against the building, also on the left.

Fig. 2 shows the first lift on the 50-feet derrick in the street. A difficulty was experienced in obtaining permission for the heavy guy seen at the top of the picture. Ultimately, it was passed over

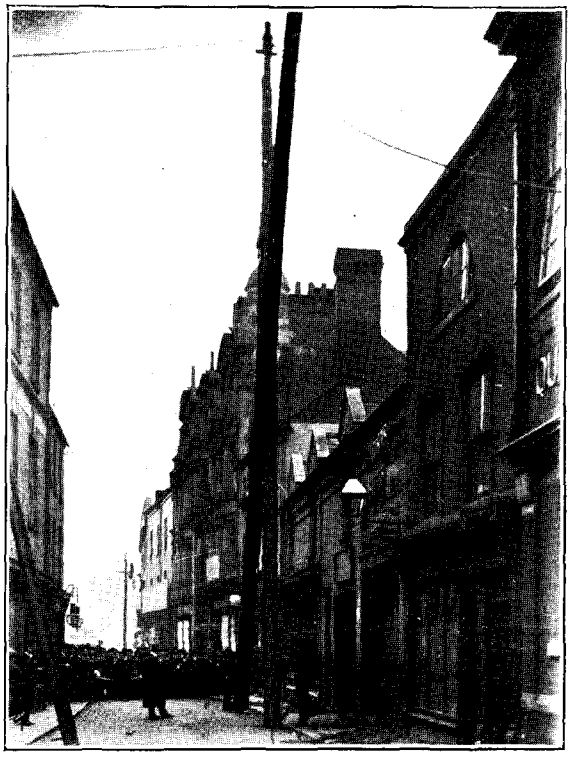


FIG. 2.

the buildings in the next street and made fast to the steps of a sewer manhole some 70 yards away. After passing over all three derricks it terminated on wall spikes on the adjoining property.

In Fig. 3 the pole is turned and preparation is being made for

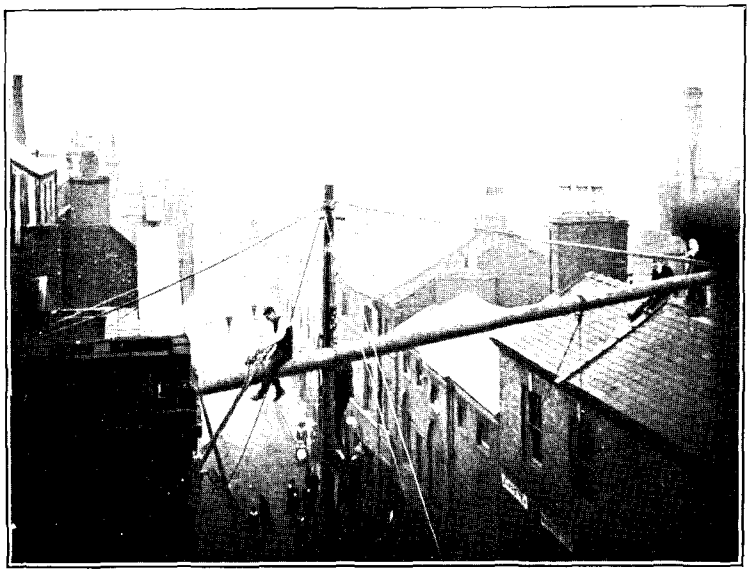


FIG. 3.

attaching the second set of tackle. This view was obtained from a neighbouring chimney.

Figs. 4 and 5 show the pole between the first and second and the second and third derricks respectively.

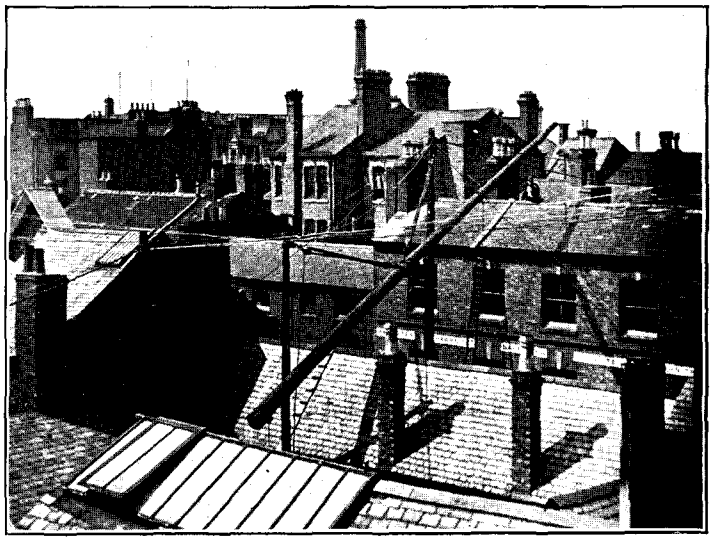


FIG. 4.

The job was started at 6 a.m., the two derricks in the yard having been erected previously. The pole was planted and all the derricks taken down and cleared away by 8 p.m.

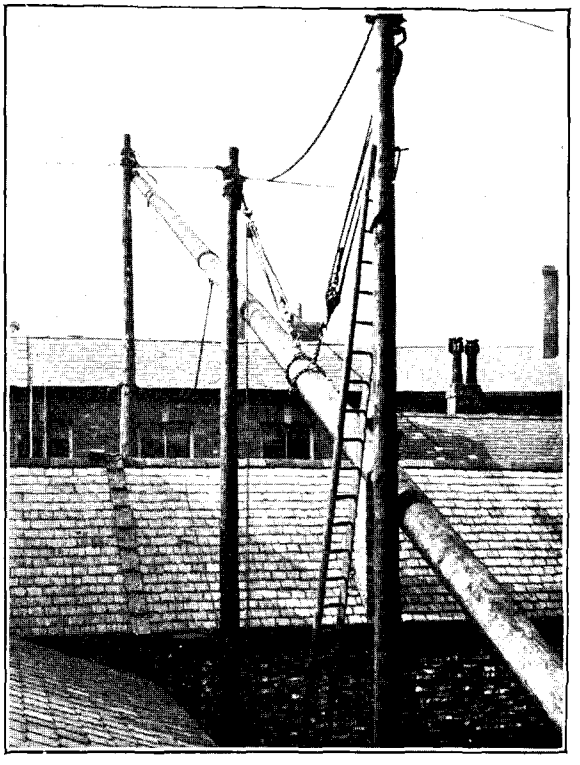


FIG. 5.

EDINBURGH CLASSES.

REFERRING to the list of successes of Edinburgh students given in the July issue of the JOURNAL, we learn that no distinction is made now between first and second-class certificates of the Heriot-Watt College.

THE NATIONAL TELEPHONE STAFF BENEVOLENT SOCIETY, LONDON.

GRANTS were made during July as follows:—

	£	s.	d.
Maintenance Department (two)	6	12	0
Engineers' Department (three)	11	8	6
Metropolitan Office (one)	4	17	6
Contract Department (one)	3	0	0
	£25	18	0

Total number of grants made since the society started, 194; value £576 16s. 1d.

Donations received: £13 16s. 6d. Number of members at July 31, 2,868.

THE MONITORS' TABLE.

By H. A. HINCKS, *Assistant Exchange Manager, Liverpool.*

IT is a matter of surprise that so important a part of switch-room apparatus has not hitherto been made the subject of an article in our JOURNAL, and it is with some trepidation that I venture a few remarks on the matter. The equipment itself is so lucidly explained in the "C" Course that a further description of it would be superfluous here.

There would appear to be several potent reasons for the installation of monitors and their tables, and the order in which these reasons are given below is not necessarily that of their degree of importance.

As a means of relieving "A" and "B" operators of irregular calls and of much work, which in the past has been a drag on the operating, they have proved invaluable. In supplying, as readily as may be, those items of information and reference, which are inevitably called for in so complex a business as ours, they have doubtless done much to advertise the utility of the telephone. By relieving exchange managers of much detail work the latter are enabled to devote more time to the pursuit and investigation of the higher problems in "traffic." By getting on the hot trail of complaints much further trouble is obviated; and by means of the intercepting and observation circuits, the causes of switchroom difficulty have been unearthed to a degree which it is not an easy task to estimate.

In these matters alone it will be generally conceded that monitors and monitors' tables have justified their existence.

Local conditions will determine to some extent the amount of monitorial staff and equipment required for an exchange or group of exchanges. I say "group of exchanges" advisedly. Where a large exchange is connected to several smaller exchanges at which the chief operators occupy positions at the switchboard during portions of the day, it *may be* desirable from the points of both efficiency and economy to transfer certain classes of (if not all) complaints and enquiries originating at these smaller exchanges to the monitors at the larger exchanges rather than take these chief operators away from their positions to deal with them at a time when their services are most needed at the switchboard.

Upon what particular basis of calculation the number of monitors' positions to be provided is formed I do not know. Much will certainly depend upon those who will have to occupy the positions.

There would appear to be no general rule governing the appointment of monitors. In some districts the position is senior to that of a supervisor, whilst in others the reverse is the case. Personally I think the two classes should rank equal, and the matter is best dealt with by the selection of the most suitable. One girl may be a complete success as a monitor but somewhat of a failure as a supervisor and *vice versa*. If a wise choice be made the harmony between the supervisors and monitors will be such as to produce the best of results.

As to her qualifications, a monitor should above all things possess a pleasant voice. If this be absent then all other virtues are useless. A harsh tone would not seem sympathetic under the most favourable circumstances, and sympathy in very large doses must be served out to the majority of those subscribers whose calls mature at the monitors' table. Another important asset is the ability to impress the caller with the fact that his enquiry or difficulty is being dealt with in a business-like manner by a competent official. Patience (with a big P) should be a constant and preponderating quantity in the nature of a monitor; and self-possession is very essential if she hopes to hold her own in the course of a controversy with a vexed subscriber. It is taken for granted that a monitor is an efficient and capable operator, thoroughly conversant with all the current rules, regulations and instructions in force in the Traffic Department.

Let us now turn to the method of handling the calls at the monitors' table. Unlike the operators, the monitors have no set phrases and expressions laid down by Head Office for their use, and without knowing what obtains at other centres, a brief description of the methods and phrases in use here may be both interesting and useful. The lines from the multiple to the monitors' table are not used indiscriminately but are divided into five groups and marked respectively, peg, directory, service, complaints, and enquiries. Little explanation is necessary to describe the traffic passing over each. The group marked "peg," is used when a caller has asked for a number which for some reason is plugged out with a service peg. Enquiries for a subscriber by name are connected to the next group. When an operator has something to report, say, a fault in the apparatus, she uses the group marked "service." The two last groups need no explanation.

The size of these groups has been determined in much the same way as that used to ascertain the junction requirements to other exchanges, due regard being paid to the amount of each class of traffic and the average duration of the calls. The lines terminate on the monitors' table in the same order and with an equal number at each position.

Appreciable advantages are gained by this arrangement, as will be seen. When the monitor receives a call she knows exactly what sort of a message is coming through and frames her answer accordingly. Peg enquiries are met with: "What number are you wanting, please?" A directory enquiry is challenged with: "What name are you wanting, please?" For other calls the expression is "Clerk-in-Charge." These expressions bring the caller to the point immediately, thereby saving valuable time and obviating unnecessary questions. The latter expression has much to commend it. Both the directory and the instrument instruction card advise the subscriber to make his complaint or enquiry to the "clerk-in-charge," and it would seem inconsistent if after asking for that official he is put into communication with someone who announces herself as "the monitor" or "the Complaint Department."

Under the arrangement described, each monitor deals during the busy periods with particular classes of traffic and naturally becomes expert to a high degree. Again, "repeat" complaints generally come to the particular monitor who handled the original complaint (they should in every case be referred to her) and the caller is spared the trouble of recapitulating his difficulty. Complaints, like bits of scandal, lose nothing by being told over again, and the repetition must add to the annoyance of the subscriber. Another advantage is that the books or cards of reference are restricted to a minimum of duplication.

So far as possible every complaint or enquiry should be brought to a prompt and satisfactory conclusion. In the case of complaints, before connecting the subscriber to the monitor, the operator should give a brief and concise history of the facts of which she has knowledge, and which bear directly on the complaint to be made. This will enable the monitor to grasp the matter immediately, and may save her from having to refer back to the operator. Where it is not expedient to hold the subscriber up whilst prosecuting her investigations, it is imperative that he be called up later, and given the results of those investigations. Even if the explanation is unsatisfactory, the subscriber will derive some consolation from the knowledge that his complaint has had due consideration.

When dealing with general enquiries in which it is necessary to refer to another department, it is usually advisable to connect the subscriber to that department, keeping an eye on the connection, as it were, until it has been satisfactorily dealt with.

As a means of educating the subscriber, the monitors are an important factor, and a certain proportion of those subscribers whose erratic observance of telephone instructions is detrimental to the service should always be under observation. Subscribers' irregularities should be taken up politely but firmly, and if the reasons for issuing instructions are intelligently explained to the erring one, he will readily appreciate the benefits to be derived from following them. Difficult cases should of course be referred to the exchange manager.

As an instance of what may be done in the direction of educating the subscriber from the monitors' table, I may state that to-day our directory enquiries are not 50 per cent of what they were some four or five months ago. Prior to a certain date, if a caller asked for the number of a subscriber, the monitor merely looked it up and gave it without comment. To-day she also looks it up, but if there is no

apparent reason why the caller could not have found it in the current directory, he is politely told that the number appears in the present issue of the directory. I am not aware that up to the present any one caller has taken exception to this treatment, and the results are ample justification of the method.

TELEPHONE WOMEN.

XLVII.—ANNIE SPEERS.

MISS SPEERS entered the Company's service at Belfast on Sept. 16, 1894. The exchange at that time was situated at 16, High Street, in premises rented by the Company, and there were about 700 lines connected to the switchboard. Headgear receivers were not then in use and the transmitters were suspended in front of the operators. The staff consisted of a chief and about fourteen operators. After the transfer to Upper Queen Street (the Company's

ANNIE SPEERS.

own premises) in 1900, a larger staff was soon necessary to provide for the increased subscribers, and in June, 1902, Miss Speers was promoted to the position of Supervisor, in February, 1905, to that of Monitor, and in July, 1907, to be Clerk-in-Charge, which post she retains with credit to herself and the Company. She is of a cheerful and pleasant disposition and is very popular with all the staff. Her principal recreations are tennis and cycling, and she is also interested in painting.

XLVIII.—MINNIE CATHERINE JINKIN.

MISS MINNIE CATHERINE JINKIN, Travelling Supervisor for the Plymouth district, commenced telephone life on March 11, 1898, at Plymouth Exchange, which was then situated in Victoria Buildings, and to which about 260 subscribers were joined up. Discipline in those days was not what it is at present, and the clerk-in-charge used to take a turn at the switchboard. The exchange was removed to its present position at the Central Exchange Buildings in May, 1900, the capacity of the switchroom being considerably increased and a separate comfortable retiring room for the operators provided. Once, whilst taking duty at Mutley Exchange, which was a residential sub-exchange at Plymouth, a live traction wire fell across a subscriber's line and Miss Jinkin had the experience of assisting at the quenching of a fire in an exchange. Sand was liberally used until the scene almost resembled the sea-shore. Owing to the efficient manner in which her duties were

MINNIE CATHERINE JINKIN.

carried out, Miss Jinkin was appointed Travelling Supervisor for the Plymouth district in October, 1908, and represented the Western Province (Travelling Supervisors) at the Annual Meeting of the Company's Officers in London in May, 1909. She has served under three district managers and three local managers, and devotes all her spare time to cycling, boating, walking and reading.

PRIVATE BRANCH EXCHANGE ADVERTISEMENTS.

AN interesting sequel to Mr. W. F. Taylor's article in last month's JOURNAL in the form of a letter from Col. Strachey, the secretary of the Army and Navy Co-operative Society, has been received by Mr. Taylor, and is well worth publishing:—

Dear Sir,—I noticed in the August issue of THE NATIONAL TELEPHONE JOURNAL an article by you in which you describe what you think a good system for drawing the attention of the public to telephones placed in retail shops.

I imagine that you had in your mind the system installed here—if so, it would perhaps interest you to know that at the end of the first year's working we, or rather the public, will have paid the entire rental of the 57 instruments in use.

This is the more satisfactory as we have used these instruments to a very considerable extent for our own business purposes, and should certainly have had to install most if not all of them for our own work in any case.

It may, moreover, be considered probable that as the system is a new one to the British public and has only been running for a year in the stores we may expect better results in future.

The weekly returns are certainly increasing, and this points to the fact that the arrangement is a convenient one to our members.

You are quite at liberty to show this letter to anyone thinking of installing a similar arrangement.—Yours faithfully,

1, Howick Place, Westminster, Aug. 19. (Signed) J. STRACHEY, secretary.

Visitors.—Mr. J. Frank Brown, Postmaster-General of the Transvaal, and Mr. J. Grant, Telephone Engineer for the Colony, visited Telephone House during the month of August.

The National Telephone Journal.

"BY THE STAFF FOR THE STAFF."

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VOL. IV.] SEPTEMBER, 1909. [No. 42.

MEASUREMENT.

IN another column we publish an article by Mr. COHEN on the "Impedance of Telephonic Apparatus," summarising the results of a very useful research which has been going on at Telephone House for some time. The results therein shown give the properties of a number of pieces of apparatus used by the Company, as measured by a current which one may call telephonic, that is, not only of high frequency but also of low amperage and specific wave form. There has been no list such as that we now give published before, so far as our knowledge goes, and in the few isolated instances where such measurements have been given, the actual conditions have been ignored or misunderstood, so that the figures quoted have been misleading. A figure of 15 henries has been more or less widely quoted* as the inductance of a 1,000-ohm magneto bell, whereas, for what is apparently the same piece of apparatus, Mr. COHEN gives 1·305 henries. In the case of the 15 henries the effective resistance is not given. It is therefore not possible to calculate the impedance of the apparatus, and this illustration brings out clearly the necessity of knowing the effective resistance as well as the inductance. It is obvious that the steady current resistance of 1,000 ohms in the case of the bell is of no use at all when calculating the impedance by the formula $I = \sqrt{R^2 + p^2 L^2}$; what is necessary is the effective resistance under the actual conditions, and this Mr. COHEN shows is not 1,000 ohms, but 7,580.

The probable source of the error in the case of the 15 henries is that the measurements were made by MAXWELL'S method, which, although accurate enough for ringing current frequencies, does not necessarily give a result which is true for telephonic frequencies, and the illustration of the bell above given is taken not to show that the earlier measurement was wrong, but in order to demonstrate the importance of Mr. COHEN'S article.

* *Electrical Review*, April 15, 1898.

The figures now given will satisfy a very real want in the telephone art, and we may expect to see them widely quoted. They are, at any rate, evidence that in spite of the short remaining period of its time the National Telephone Company is continuing to take an advanced part in the work which leads to improvement in the art, and we feel therefore justified in drawing attention to that work.

OPERATORS AND PUBLIC.

A PARAGRAPH has been circulated in the Press (in some cases with the heading "Where Telephonists may Swear"—which expresses quite a different idea from that intended) to the effect that a telephone subscriber in Iowa, who had been deprived of service for abusive language to the operator, carried his case to the Court of Appeals where it was decided against the telephone company. The decision of the Court was that telephone companies were in business to supply telephonic communication and that it was not in their power to dictate the kind of language to be used over the telephone. We do not think that in giving this astounding decision the Court can have been cognisant of the offensive abuse a subscriber with a low class of mind is capable of using over the telephone to girls to whom he is invisible, but unfortunately not inaudible. Had his abuse been directed to another subscriber the decision would not have been so extraordinary, for the latter would have had other remedies. Certainly, in a sense, it is not the business of a telephone company to dictate the language to be used over their telephones; nor do they wish to. The speaker is at perfect liberty to talk in English, French, German, Arabic, Esperanto, Volapük, or even Iowan; to drop his h's, clip his g's, confuse his personal pronouns, or split his infinitives; to commit all kinds of grammatical debaucheries or solecisms; but, when it comes to foul language, telephone companies must be, and in most civilized countries are, in a position to protect their operators.

HOLIDAYS.

AN allusion by the writer of our "London Notes" to the return to work of "giants refreshed" recalls the whole object and proper *raison d'etre* of holidays. The time is, generally speaking, far behind us when employers looked upon holidays as an unfair toll exacted by custom, whereby the employed received pay for a certain number of weeks and did nothing in return for it. Most employers, we believe, grant a reasonable holiday quite ungrudgingly, believing that man requires annually a short, complete rest from his diurnal labours, and that the break benefits the worker and his work alike. How complete the change is, and what an epoch, so to speak, it constitutes in the yearly round, all those who enjoy only one annual vacation of any length can testify. Most of us have probably experienced a sense of the discrepancy that exists between the light in which the fortnight (or whatever the period may be) allotted to our forthcoming holiday appears to us and that which it appears to the man remaining at work. To him it appears as a certain number of working days. A date a fortnight hence is simply a date a fortnight hence; but to us it is a date on the other side of a chasm; it is remote, vaguely distant. For in the intervening period comes that absolute alteration of routine, or, better still, complete absence of routine, that change of scene, that oblivion of business which is good for even

the most enthusiastic telephonist for a short period of each year. Much is printed in the daily Press as to the wisest method of spending one's holidays—complete rest, days at home in bed, sea air, country air, exercise, abstention from exercise, all have their advocates; but the main benefit of a holiday undoubtedly lies in the change it brings from the life of the rest of the year. The responsibilities of many of us do not admit of our being completely out of touch with our duties, but we get a release from the daily round which is incalculably beneficial in sending us back as "giants refreshed."

"*Cœlum non animum mutant qui trans mare currunt*" is especially true of the telephone man. He may cross the sea to the Isle of Man, Ireland, the Channel Islands, the Isle of Wight or the Continent and obtain a change of scene, but not so easily a change of thought, for the ubiquitous telephone is extended into all lands. Even the Faroe Islands and Iceland now have flourishing telephone systems. Bell signs, poles, wires, derricks, and other outward and visible signs of his craft confront the holiday maker in the most unlikely places. The enthusiastic telephonist on his vacation often feels the desire to visit the exchange in some provincial and foreign town, especially if it presents any special feature of note; but keen interest in telephone practice is strangely mingled with detachment. As a man might intelligently inspect the machinery of a ship or a motor factory, so he surveys and studies other men's work. It is a recreation and not a duty, and therein lies the difference. That release from the claims of duty for a short period we believe to be beneficial, and we hope that a complete change of thought and scene will bring our readers back to their life-work rested and refreshed in the fullest sense of the words.

THE PRIZE COMPETITIONS.

IF anything were needed to ensure the continued success of the telephone societies in the forthcoming season—which, happily, is not the case—it would surely be found in the prize competitions which are to take place on the several subjects of office work, outside and inside plant, traffic and general. The premiums offered by the Company are liberal, and the varied range of subjects will make it possible for all grades of the staff to compete with some prospect of success. The term "general" covers a very wide field indeed, even when limited to telephony, and embraces all the numerous branches of our work not specified in the other headings.

It has always been one of the great advantages of the telephone societies that they afford a unique opportunity to every man who has anything to say, to say it. A man can no longer feel that he is on a siding or in a backwater, between which and the main stream innumerable obstacles exists. His light need no longer be hid beneath a bushel nor his talent wrapt in a napkin. This year, however, in addition to the emulation of his fellows, and the desire to give play to his powers, the stimulus of a money prize will also exist. We have little doubt that some exceptionally interesting papers and some instructive ideas will be brought to light.

NOTICE.

PORTRAITS on sunk art plates of Mr. J. M. SHACKLETON, Mr. E. WILLIAMSON, and Mr. FRANK GILL are now obtainable, price 6*d*. each. That of Mr. C. H. SIBLEY will be ready shortly.

HIC ET UBIQUE.

MR. GILBERT TAYLOR, of the Company's Bristol staff, performed a plucky feat in rescuing a boy from drowning in the river near the Corporation Dry Docks, Bristol. A boy playing on the river bank fell into the water, and Mr. Taylor, without waiting to take off his clothes, dived into the river to the lad's assistance, a feat which was rendered the more difficult as he had to go beneath some timbers to effect the rescue.

UNDER the heading "Poultry, Birds, &c.," in a provincial paper appears the following announcement:—

> The proprietors of the —— *Telegraph*, who have now completed an extensive private telephone service all over the district, are enabled to sell the whole of their well-trained messenger pigeons, together with baskets and all appliances: offers wanted.—Address, General Manager.

If the installation of the telephone would enable the proprietors of certain journals to dispose of their stock of well-trained *canards* the telephone would be an even greater blessing to mankind than its inventor ever anticipated!

A PORTSMOUTH evening paper informs us that the Corporation of that town has been asked whether it would be prepared to absorb the National Telephone Company's Portsmouth system, and has no doubt that they will answer in the affirmative! Further on the newspaper in question gives expression to the following pregnant remarks:—"Having made a careful examination of income and expenditure the committee find that they have been cutting rates a little too fine, the cheapest service of all being conducted at a loss." The modest limitation of the fear of loss to the "cheapest service" is precisely where one's sense of humour is touched. What interesting depths of meaning those few lines contain.

"OF their ability to undertake the work," we are told, "and carry it on successfully, the committee entertain not the slightest misgiving." Further on we hear again the old tale: "The town has demonstrated that cheap telephones are possible." It was the brilliant mission of Glasgow and Brighton to demonstrate (at a loss) the same thing—no doubt to the intense delight of the ratepayers. Portsmouth, however, have under consideration the raising of their three cheapest rates. This done, they will doubtless continue the demonstration until the day of reckoning arrives when the "success" of the Portsmouth telephones will be, to quote again, "an object lesson to the whole country."

A SUPERINTENDENT making a call from a local call office in strange parts was asked for the usual fee of 2*d*. He objected to pay and produced evidence of his identity. Even this did not at first effect the desired result; but later, becoming convinced, the operator exclaimed: "I'm so sorry, I thought you were the police!"

MR. GOWER AND THE TELEPHONE.

IN Major Pond's book, *Eccentricities of Genius*, occurs the following passage which will be of interest to telephone men:—

> Mr. Alexander Graham Bell came to me wanting to interest me in a new invention that he had, by which he could hear in Lowell, or in any other town, a lecture delivered in Boston. I went out and heard a test of it with Mr. Bell. I suggested to him that it would be just the thing for communication between business offices and factories, livery stables and hotels. He wanted me to go into the business with him, and urged me to do so. He spent an hour by my desk talking about it. I spoke about it to my partner, but he reminded me that our business contract would not admit of speculation of any kind. I felt pretty certain that there was a fortune in the business, and came very near telling him that I would leave the Lyceum and take the risk and go into the telephone business. As Mr. Bell was leaving my office a gentleman from Providence who ran a lecture course in that town came in, and I said to Mr. Bell: "Here is the man you want for that business."
>
> Turning to the other gentleman, I said, "Gower, here's something that there's a fortune in. Now you go into this thing."
>
> Mr. Gower did his errand in a moment, and walked out of the office with Mr. Alexander Graham Bell. I never saw him afterward. Gower went up in a baloon in Paris and was never heard from. It was said that he was worth over million dollars when he disappeared—all from the telephone business.

A HOLIDAY EXPERIENCE WITH A MOTOR CAR.

When some of my friends asked me to write a description of my holiday for the JOURNAL, they knew that a small motor car was expected to form a not unimportant part of my arrangements. Everyone hopes on starting a tour that there will be little or nothing to record, but this has not been my experience.

Let me say my first idea was to hire a car for a month, but the price charged for hire put this out of the question. The quotations were from £44 a week downwards,—but not sufficiently downward for a telephone man with 1911 in view. To buy seemed, for the same reason, impossible, so I at last decided to try a motor cycle and side car, and even got as far as to make a bid for one. Luckily or unluckily the bid was refused, and before I had time to increase it, as I probably should have done, an unkind acquaintance filled my family with harrowing tales of the danger of motor cycling. (I have seen this idiot on a motor cycle himself within the last few days.) I heard of a motor for sale cheap and was prepared to buy, but the owner declined to part with it before the end of August. As time was getting short I gave up the idea, when a friend told me of a very small motor going cheap. The temptation was too strong; I bought it within one week of my holiday. Then to learn to drive and manage the machine. I could only get out four times before the beginning of my holiday, which is hardly enough practice to enable one to undertake the responsibility of driving—although the only qualification required for a licence is 5s.—so I arranged to take a driver with me.

First Day.—We started at 6.45 a.m.; we twice stopped for minor trouble, the first time finding the nut holding the ignition wire gone. As we had not another there did not seem much chance of getting one, as by this time we were miles from London. We had, therefore, to borrow a terminal from the battery, but it was too large, so we wedged it on with a piece of wood found in the road, and secured it with a bit of copper wire. Later another wire served us the same trick. (Why on earth they are made without lock nuts or collars I can't imagine!) This time we could not get any nut to fit, and for a few minutes felt rather blue. On looking closer, however, I found the wire was only connected to the engine frame, so this was soon got over by putting it under a cylinder bolt.

We got on splendidly, with these exceptions, but as the first troubles arose when I was driving, it was some relief to me when our third and more serious breakdown occurred, that the professional driver was in charge.

We made excellent time for a car of this class. Police traps had no terrors for us. I defy anyone to get twenty miles an hour out of my car—except on a very steep hill. We averaged rather more than twelve miles an hour till lunch, and afterwards we had just got up a long hill when the engine struck work. Half-an-hour's work proved the trouble to be something serious, so we turned the car round and pushed it to the top of the hill, then jumped in and had a very welcome free wheel for half a mile or so, after which more pushing was entailed.

We arrived at the village blacksmith's and with his assistance took the engine to pieces and found half the crank pin broken off as well as other troubles. The blacksmith was a practical engineer and cheerfully undertook the necessary repairs; but the delay necessitated finding a bed at the local inn. The condition I was in upon arrival can best be guessed when I say they were not at all keen in taking me in, and, when they did agree, showed me into a shed in the yard where they gave me a large piece of soap, a scrubbing brush and a ladle, and told me to help myself to water from the rain tub. They said I was not fit to go upstairs—and no doubt they were quite right.

Second Day.—Next day we got the car together and started at 12.45 p.m. We got on very well until the water tank began to leak, but we got on to Stamford and had it repaired, and started about six o'clock for Grantham—21 miles with 21 hills! It took nearly three and a half hours to do this distance, owing to troubles.

Third Day.—My driver did further overhauling, and we left for Retford, 35 miles. We got on fairly but not satisfactorily, so, as the three days allotted to the journey were nearly up, I had the car again overhauled and left my man to finish the journey alone. There were still about 92 miles to do, and he turned up about two o'clock on the fourth day.

The day after arrival the car went for a thorough overhaul, which of course ought to have been done had time permitted before the long journey was undertaken. The result has been entirely satisfactory, and the hills in the neighbourhood, which are very severe, are taken in ordinary course without any trouble.

TESTING SWITCH.

BY J. W. HAMBLETON, *Engineer-in-Chief's Department, Nottingham Factory.*

No doubt it will be of interest to many readers of the JOURNAL who have to deal with the various articles received from the factory, to know the methods employed by the Engineer-in-Chief's Department, and the apparatus used in testing the instruments repaired there. I therefore make no apology for giving the following description of the principal testing switch, which is in use in the Engineer-in-Chief's Department at the factory, as well as at the Metropolitan workshops, and the British L. M. Ericsson Company's works, Beeston.

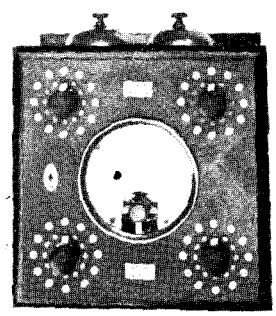


FIG. 1.

Fig. 1 shows an outside view of the instrument. It is made up of ½-inch walnut, and the inside measurements are 7 inches square and 6 inches deep. A moving coil voltmeter (No. 2 in the Company's Stock List) is fixed in the centre of the door in front and the needle readjusted to point normally to the extreme left of the scale. The glass is drilled opposite the centre of the coil, and an attachment fitted whereby contact pieces can be so adjusted to make connection with the voltmeter pointer and so bring a relay and buzzer into circuit when taking repetition tests, if desired.

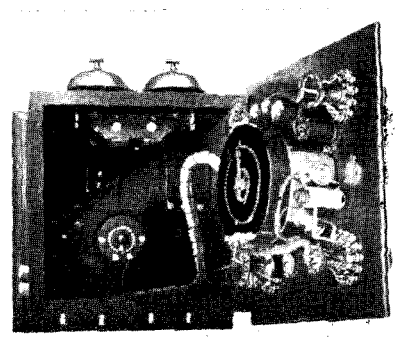


FIG. 2.

On the door of the instrument are also four circles of contact studs; on each circle a revolving contact arm consisting of laminated german silver springs is fitted. The uses of each stud are indicated

by means of an endolithic ivory tablet suitably engraved, and sunk flush with the wood on the outside.

A 1,000-ohm magneto ringer is fitted on the inside top of the case, with the domes outside, and four terminals are fitted at the bottom, and twelve on each side, for use in wiring up generator and batteries.

The inside of the instrument can be seen from Fig. 2. The various resistance coils, switches, buzzers, etc., are either mounted on the inside of the door and inside the voltmeter case, or inside the instrument, and the connections are cabled from the door to the terminals.

The following ranges can be obtained :—

V	= 0 to 6	each division corresponding to	·1 volt.
V × 10	= 0 to 60	,, ,,	1 volt.
A ÷ 10	= 0 to ·6	,, ,,	·01 ampere.
Amp.	= 0 to 6	,, ,,	·1 ampere.
Ohms	= 0 to 1,000 direct reading.		
Ohms × 10	= 0 to 10,000 ohms × 10 on scale.		
Ohms × 100	= 0 to 100,000 ,, × 100 ,,		

In testing ohms direct, or when multiplied by ten, one cell is employed, and when reading up to 100,000 the battery switch is set at 10 cells.

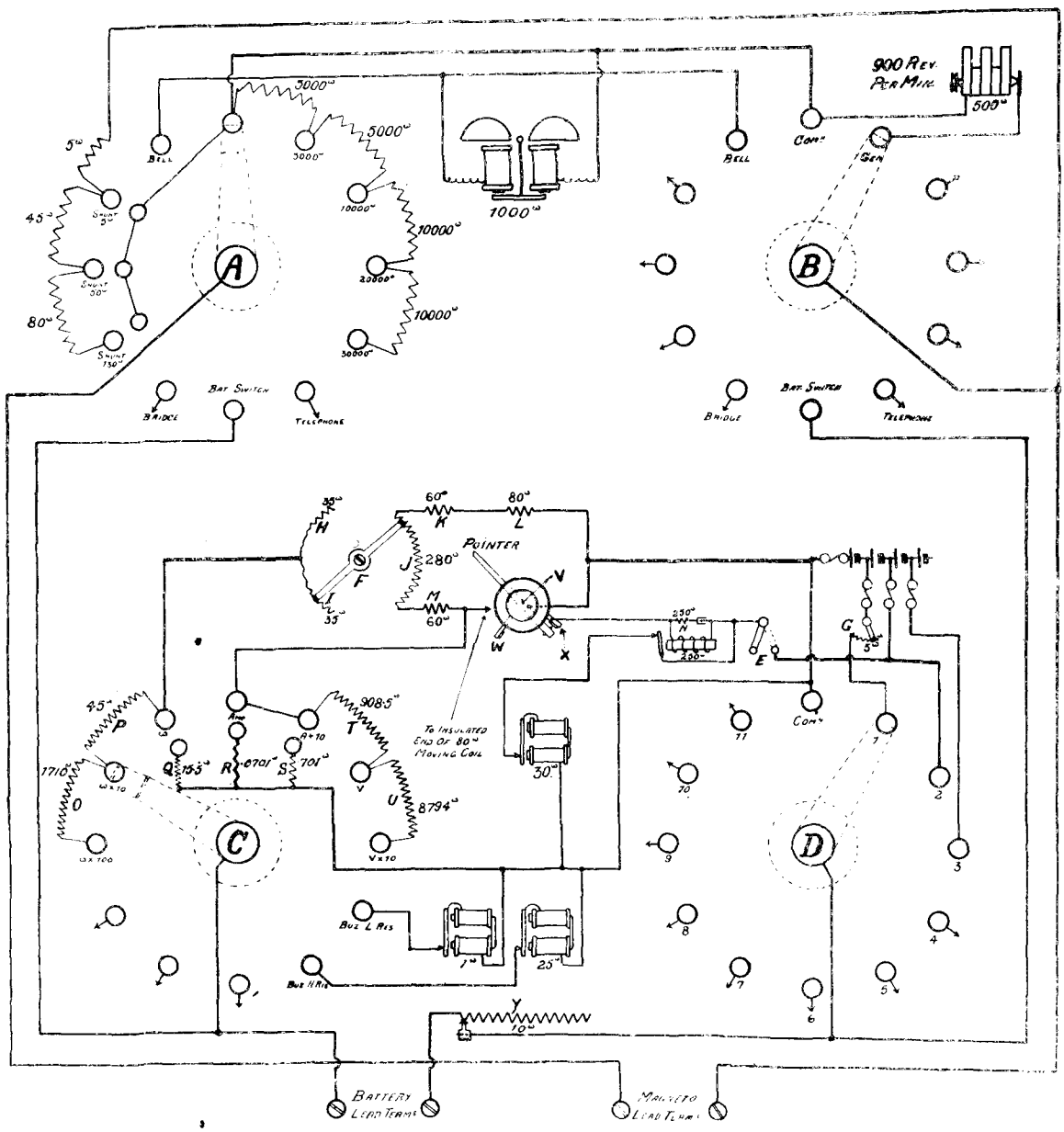


FIG. 3.

The instrument possesses a wide range of usefulness, and serves the purpose of a direct current voltmeter, ammeter and ohmmeter, and through certain combinations of switch levers one can obtain alternating generator current, magneto ringing, with or without resistances or shunts, as well as buzzers, battery current 2 to 22 volts with means of varying the strength or amount of current and various other purposes.

The voltmeter scale reads 0 to 6 and each volt is subdivided into ten divisions. On the same scale amperes are similarly read. Above the volt and ampere scale is one giving ohms direct. It is calibrated so as to read "no resistance" when pointing to extreme right of scale and "infinity" when at extreme left.

The connections of the instrument may be traced from Fig. 3. The top circle of studs are for magneto testing purposes, and the *modus operandi* is as follows:—

For instance, if it is required to ascertain if a ringer will operate through 30,000 ohms: arm "B" is placed on stud marked "Gen." and arm A on stud marked 30,000, or if it is required to obtain generator through the 1,000-ohm ringer the arm "B" remains on "Gen." and arm "A" is moved to stud marked "Bell," and so on for whatever combination is required. In a similar manner, any direct current test is obtained from the combinations of the bottom circle of studs.

Some explanations may be necessary to enable the reader to

follow the uses of the various resistances and switches shown on the drawing, and the principle on which the ohmmeter acts.

V is the recording instrument with the moveable coil, 80 ohms.

J is a rheostat to compensate for rise or fall in voltage of the ohmmeter battery, and as the arm F moves over J it also moves over H or I, thus keeping the resistance in that circuit constant, at the same time allowing a greater or less proportion of current to pass through the moveable coil so as to give a full deflection when the leads are short circuited.

The total resistance between the centre point of H I and the positive side of the battery will be seen to be constant at 140 ohms.

This is now shunted with the resistance coil Q, 16·5 ω, which is connected up to the shunt stud, and the arm "C" makes contact with both studs at the same time, so that one-tenth of the current only travels through the original circuit. This registers ohms direct on the scale. The instrument is calibrated with the arm F in the centre of J, using a 2-volt accumulator. The rheostat G is placed in circuit so as to keep the testing leads at a constant resistance of 5 ohms, and, as this is allowed for when calibrating, the resistance of the leads has not to be taken into account when taking resistances.

The total current through the moveable coil itself will be seen to be $\frac{1}{100}$ ampere, and this gives full deflection. The correct sensibility of the instrument is first obtained by making use of the magnetic shunt across the pole pieces to strengthen or weaken the field as required.

When arm "D" is placed on stud 1, and arm "C" on stud ohms × 10, the resistance figures on the scale must be multiplied by ten. On this stud the 15·5 ω shunt Q is cut out, but owing to the resistance coil P 45 ω placed in series, the resistance now is ten times that of the ohms direct, but the current $\frac{1}{100}$ ampere is still the same in the moveable coil, and gives full deflection. When arm "C" is moved to stud ohms × 100 "D" must be moved to stud marked 10, and here again, the same current, $\frac{1}{100}$ ampere will be seen to flow through the moveable coil when the leads are short circuited, as the resistance is now 100 times that of ohms direct. Whatever reading we have on the scale it is to be multiplied by 100.

As the resistance of the instrument is constant for each combination used, the drop of volts depends on the relationship between the resistance being tested and the resistance of the instrument.

When arm "C" is placed on studs amp. there is a ·0701-ohm shunt R across the recording instrument circuit, and we read amperes direct on the scale. When the arm is moved to the next studs A ÷ 10 the shunt S ·701 ohm is placed across, and we read on the scale, amperes divided by ten.

The 10-ohm rheostat Y in the battery lead circuit is normally out of circuit, but it is brought into use for regulating the amount of current, as for instance when testing relays, with the minimum and maximum currents allowed, or for testing the amount of current at which fuse wire will blow, and various other uses.

Coils marked T and U are resistances inside the voltmeter case, and which are placed in series with the moveable coil for reading volts direct, and multiplied by ten.

The face attachment on the instrument glass is brought into use when taking repetition tests, such as the resistance of a large number of coils.

The contact arms W and X are set for the percentage of error allowed in the resistance of the coil under test. If the latter does not exceed this error the pointer is free from W and X, and it will be seen that the 30-ohm buzzer works, showing that the resistance is correct. Should the percentage of error be exceeded, the pointer will make contact on either W or X, and the relay N will then cut the 30-ohm buzzer out of circuit, giving an indication that the coil is wrong.

This saves the trouble of reading the resistance on the scale every time. The relay N is shunted by a 250-ohm non-inductive resistance, with a 2-microfarad condenser in series, as this is found to overcome any tendency of the pointer to stick on contact points W and X.

The switch E is used to cut off the battery when not required.

The 1-ohm and 25-ohm buzzers are found useful for a variety of tests.

Two pairs of flexible testing leads are used, on the ends of which spring clips are connected for making the necessary connections to the instruments being tested. The leads are automatically held out of the way when released.

In the case of using a Weston voltmeter for testing lines, which is now the general rule in exchanges, elaborate tables have to be used for varying voltages of the testing battery, and as this must entail extra work I venture to suggest that some such compensating switch as described in this article would do away with the necessity of using these tables. The readings would give the resistance direct in ohms, and the adjustment required to correct the variation, if any, in the voltage of the battery would take a matter of only a few seconds to do before testing commenced.

The switch and circuits have been designed by Mr. Macadie, Factory Electrician, to whom I am indebted for the photographs and drawing shown.

STORES LEDGER WORK IN CONNECTION WITH THE NO. 6 RETURN.*

BY STERIKER GASSIOT HARE, *Gloucester.*

THE stores work is divided into three sections—first, the ordering and issue of stores; second, general stores management; and third, bookkeeping and stocktaking. The duties of the stores clerk are concerned in these three sections, but primarily our discussion to-night is based upon the third section, *viz.*, bookkeeping.

It is apparent that before stores can be booked in or out they must be obtained. The procedure is therefore adopted of getting requisitions sanctioned and passed forward by the district manager to Head Office Stores Department. Prior to despatch it is the duty of the stores clerk to number each requisition, and enter it in the outstanding requisitions book, so that a correct record may be kept of stores as supplied, and any requisition that may remain unexecuted easily detected.

Stores requisitioned for are supplied from various sources, either direct from the suppliers (of whom Head Office has purchased), Head Office Stores Department, Notts Factory, or they may be transferred from another district. But be that as it may, with every consignment of goods, from a load of poles to a single screw, an invoice or debit note is rendered. An invoice if from suppliers, or a debit note if from Head Office Stores, Notts Factory, or from one of the Company's centres.

As soon as the stores clerk receives invoices or debit notes he makes the necessary entry in the outstanding requisitions book, checking it with the quantity asked for against such requisition. The object of this is to detect any error either in the quantity, description of article supplied, or clerical error in the invoice.

Each Friday the stores clerk receives from the various centres of the district stores credit slips, debit slips and foremen's requisition slips for material booked in and out during the week. Credit store slips refer to stores received from suppliers, or stores recovered from works orders. Stores debit slips are in respect of stores transferred to other centres, or the factory, etc.; and foremen's requisition slips for stores issued out to the various works orders. Therefore we sum the matter up thus—inwards, outwards.

To deal first with stores inward from suppliers. Week by week as the clerk receives the credit store slips already referred to he inserts against each entry the value as stated on the invoice or debit note, carefully noting that both invoice and credit sheet agree. He then posts each entry from the credit slip to its ledger card.

Ledger cards are made out in sequence to agree with the Stock Price List, so that if there are 1,200 or 1,500 cards in use the clerk may without difficulty and instantly procure one when required to do so. Each card has to be folio'd and bear the Stock List number of the article to which it refers, and the price.

By this process the stores clerk is enabled to become acquainted both with the Stock List and market prices of material. This is necessary to him so that he can promptly fulfil the various duties

* Abridged from a paper read before the Gloucester District National Telephone Society.

that surround his path. Not only is this knowledge useful for the present time but of great advantage to his future career.

At the close of the month, viz., the last Thursday, the stores clerk commences preparation for the winding up or summarising of the material in and out for the monthly returns, viz., 6 and 6A.

At the expiration of the month the stores credit slips are entered into the goods inward book, centre by centre, and in numerical order. The material that has been received from suppliers is entered in the column "Suppliers, London," and the stores received from other districts in column "Other centres."

The first item on the return that engages our notice is "Stores purchased through Head Office," that is to say, suppliers as per invoices received. The stores credit slips having been priced from the invoices received, posted on the ledger cards and entered in the goods inward book, the stores clerk arranges the invoices in alphabetical order of suppliers' names. Each invoice has to be carefully checked, bear the Company's stamp—"Date goods received"—likewise a further stamp with the particulars, "Date entered in ledger," "Folio," and "Amount."

Having done this a tabular statement of these invoices is made on a form known as 6A return. The gross total agrees with the total of the column in the inwards book, "Suppliers, London." This return being complete and balanced is signed by the district manager, as is each invoice, and then despatched to Head Office. The total amount of the return being carried forward to the No. 6.

Stores purchased per cash statement (No. 5 return) refer to stores or tools of sundry nature, bought locally, which are not described in the Stock List and not usually purchased direct through Head Office. The particulars of such items for the return are obtained from the clerk who deals with the petty cash vouchers and the No. 5 return. Such purchases have to be entered by the stores clerk on the stores credit slip of the centre to which they refer, and also entered in the column of the goods inward book headed "Local suppliers." They are also posted to ledger cards.

Stores received from other districts are arrived at in a similar way as from suppliers, by taking the debit notes and inserting the amounts against the items to which they refer. They are posted to ledger cards and entered in the goods inward book under "Other centres."

The debit notes are then arranged in a specified order of districts, the total amount of stores received from each centre or district on the return. The gross total on the return agrees with the gross total in the inwards book.

We have now seen how we obtain receipt of stores, and how they are introduced to the ledger, inwards book, and return. Before passing onward to goods outward it may be interesting to know that the number of credit slips from the six centres of the district during a period of twelve months is 1,011 or 84·3 per month.

Proceeding now with stores issued during the month. The foreman's requisition slips are sent into the district office every week. The stores clerk must examine these slips, and see that they follow in numerical order to detect if any are missing. At the end of the month these slips are sorted out into their respective centres and allocations. Having done this, they are entered on store issue sheets, a separate sheet for each distinct allocation; for instance, a sheet for "N," another for "Underground," "E.C.," "O.C.," "L R.," "I.R.," etc. When all the stores requisition slips for the month are entered the stores clerk has then to price each store at the ledger average price, with the exception of sales works orders, and these are issued out at the market or buying price, in order that a correct profit can be shown.

Stores recovered are booked in on a credit store slip and priced at half value of current buying price, with the exception of poles, arms, switchboards and testboards. These are recovered at their life value as the district manager may determine.

Recovered cable is dealt with in another form, according to its description and valuation by the Engineer-in-Chief or district manager. Scrap bronze or copper is recovered at the price usually obtained for it as scrap.

All the stores issued sheets for the month being priced, they are entered in the goods outward book under their respective headings or allocations. The same process is adopted with the stores credit slips in respect of stores recovered. These are arranged in numerical order according to their centres, and entered in the goods inward book. The stores inward are then deducted from the stores outward which gives the net amount of each allocation for the month. These separate items are transferred to the return and condensed into a gross total of issues for the month. The total number of issue slips for the district during a period of twelve months is 3,354 or 279·6 per month. The stores issue sheets are finally posted to the ledger cards.

Before proceeding to the next item on the return I would remark upon the deep importance for a stores ledger clerk to price the stores correctly both "In" and "Out," otherwise false or incorrect figures are shown on the returns, and the clerk condemns himself by slackness to the attention of his responsibility.

Ledger prices are gauged once in every three months, viz., February, May, August and November. I would mention that there are occasions when it is required to take ledger average prices of certain stores more frequently, but this the clerk judges by experience. The stores ledger cards are added up and the total of the credit side and the debit side of each card entered into the stores ledger balance book.

The gross total of stores as per ledger cards must agree with the gross total of stores as per No. 6 return. The same remark applies to tools, which account is shown and kept separately. Should these balances differ, viz., the return and the ledger, the stores clerk has to search until he finds the difference, so he does not have much time to laugh and grow fat.

The stores clerk has to deal with four methods of pricing, viz., "Stock List," "Market," "Ledger average" and "Half current buying price," in addition to which special pricing is required for recovered poles, arms, cable, switchboards, testboards, scrap bronze and copper wire.

We now pass on to "Stores sent to other districts." In such instances these stores are entered on a stores debit slip by the storekeeper or officer in charge of stores, and the stores clerk receives these debit slips in the same way as the others each week. Every item recorded on the debit slip is priced at the ledger average price, and to whatever district the stores are despatched a debit note is sent. Stores debit slips are dealt with in a similar way as credit slips, posted to ledger and entered in the outwards book. A tabular statement of the stores thus sent is made on the return in order of districts, of which is shown a gross total. This total agrees with that in the outwards book under column "Other centres."

On the debit note, the Stock List number of the article or articles must be quoted, also the rate charged, together with the delivery note and requisition numbers, that is if supplied against a requisition. Special care has to be taken in respect of debit notes for stores sent to Notts Factory. If sent for "Urgent repair and return," both debit note and delivery note must be defined accordingly.

When consignments of stores are sent to the factory the numbers of the cases in which the goods are packed must be stated, with the name of centre from whence despatched and the delivery note numbers.

I have now in a simple way endeavoured, principally for the benefit of junior members of the staff, to give a brief outline of a portion of stores ledger work in connection with the No. 6 returns, and explain the method of such work in a form that can be easily grasped. Although possibly uninteresting to seniors I trust my remarks may render some little assistance to juniors and others who may be interested in the stores division.

LONDON NOTES.

THE unfortunate motor mishap at Salisbury Plain a week or two ago, when several men of the 4th London Brigade Royal Field Artillery were injured and one man killed, had an especially sad interest for the staff. Gunner Snow, whose injuries proved fatal, was a testroom watchman at Kensington. He entered the service in September, 1904, and had thus almost completed five years. He was quite a young man of 22 or 23, and his sudden death at so early an age must be a great blow to his relatives and friends. He lived with his mother, brother and two sisters; to them in particular we offer, on behalf of the staff, our deepest sympathies in their loss.

IN connection with the General Superintendent's intimation that the Company are prepared to give special premiums for the best papers on given

subjects read before telephone societies during next session, the London Telephone Society has issued a special circular to its members. An appeal is made therein for an adequate response to the Company's generous offer; it is much to be desired that the committee's appeal will result in a large number of papers being sent in. The order of dates for the various subjects has been drawn for, and the latest dates on which papers can be accepted are:

Office work	Oct. 11, 1909.
Outside plant	Nov. 10, ,,
Traffic	Dec. 4, ,,
General..	Jan. 7, 1910.
Inside plant	Feb. 1, ,,

The return golf match between representatives of Head Office and the Metropolitan Office, to which reference was made last month, was played on Shortlands Golf Course by the same representatives of the two offices. It proved to be a close and exciting contest. At the eighteenth hole the position was "all square," but at the nineteenth hole Salisbury House succeeded in pulling off the game, thanks mainly to a brilliant "iron" shot by the Assistant Metropolitan Superintendent. The deciding struggle will take place later, and our sympathies are with both sides. In a matter of such moment, one must be impartial.

RECENTLY we sent a back copy of the JOURNAL to some of our large private branch exchange subscribers. As a result, four orders to supply the JOURNAL for twelve months have been obtained. We have no doubt that much of the information given in the JOURNAL month by month will be very valuable to the subscribers and their operators. We hope others will follow the good examples.

As usual in August, business has been quiet, and the thoughts of most men intent on holidays rather than work. It is, however, gratifying that new orders show an upward tendency as compared with last year. The holiday season also entails a dearth of staff news, making it difficult to procure items of interest for this column. We take consolation from the feeling that those "giants refreshed" who will soon be returning from their rural retreats will come back eager to assist in making telephone history.

Amongst those on vacation is the Metropolitan Superintendent, who is sojourning in Yorkshire. The Metropolitan Engineer has just returned from playing a strenuous part in the "Territorial" defence of Plymouth. One is also pleased to hear that many of the young men on the clerical and electrical staffs have been doing "camp" duty with their various Territorial regiments.

THE new central battery exchange at Bromley was opened on Aug. 14. The multiple is fitted for 1,620 lines, and its ultimate capacity is 8,000. There are ten "A" positions for 1,130 lines, and three "B" positions for 42 incoming junctions, 55 outgoing and three order wires. The building, which is fitted in an up-to-date manner, includes operators' quarters, stores and accommodation for the engineering and electrical staffs.

THE next change-over to central battery working will doubtless be New Cross, the date fixed being Sept. 25. The Mayor of Deptford has kindly expressed his willingness to perform the opening ceremony, and it is expected therefore that the function will be of a more important and public character than is usual on such occasions.

OWING to the appointment not having been notified in time, we were unable last month to offer our congratulations to Mr. F. G. C. Baldwin on his appointment to the new post of Assistant Metropolitan Engineer. We do so now, and our good wishes, if belated, are none the less sincere. We shall give Mr. Baldwin a cordial welcome to London, and have no doubt that the engineering staff will heartily co-operate with him in his responsible duties.

IN the Thames long-distance swim from Richmond to Blackfriars Bridge on Aug. 14, two of our operators competed. They are Miss Armstrong and Miss Bell, both of Kingston Exchange. Last year Miss Armstrong took first place

MISS AMY BELL.

MISS IVY ARMSTRONG.

amongst the ladies; this year she obtained fifth only, although her time in the water was ten minutes better, being four hours ten minutes, against four hours twenty minutes last year. Both ladies receive gold medals as the reward for completing the course.

THE latest recruit to the ranks of benedicks is Mr. H. Deane, Assistant Traffic Manager. Mr. Deane was married to Miss Patricia Morrison at St. Jude's Church, South Kensington, on Aug. 26. By his quiet, unassuming manner, and courteous disposition, Mr. Deane has secured many friends amongst the staff. Their good wishes were given material form in the shape of a handsome cabinet of plate which, in the absence of Mr. Clay, was presented by Mr. Harvey Lowe, Assistant Metropolitan Superintendent. We join in offering cordial greetings to Mr. and Mrs. Deane.

THE Hop operating staff and their friends had an enjoyable outing to Highbeech, near Chingford, on Aug. 7. Games, walks, tea, etc., filled up the afternoon very pleasantly. Miss G. Pardoe and Miss E. Heugh carried out the arrangements for the excursion and deserve great credit for the success of their efforts. J. S.

A CURIOUS FAULT.

BY J. MORRELL, *Local Engineer, Walthamstow.*

THE accompanying photograph shows a rather curious example of a fault found on a private wire at Snaresbrook. A 40-lb. bronze wire is shown passing through a branch of a tree. Apparently the wire had at first rested in a fork,

the gradual growth of which eventually caused the wire to be completely embedded.

It is estimated that the conditions shown in the photograph are the result of about three year's growth.

MASTER LIST FOR DESPATCHING RETURNS, ETC.

BY G. C. DEWAR, *Glasgow.*

IN order that the various returns, forms, etc., sent to the Superintendent and Head Office at stated intervals may be sent off in good time and a satisfactory check kept on their despatch, it is necessary that a record be available which will show the respective dates of leaving the district or local office. To attain this end it is usual, I believe, to "diary" the entries under their respective dates. This method, however, is open to objection, and as an alternative a master list of returns, which is always complete, presenting an ever up-to-date record, was designed and has been used in Glasgow for the last five and a half years. It has proved itself invaluable and the following short description may prove interesting to other districts where its use is unknown.

The difficulty in making an effective master list is that some of our returns are due on fixed dates each month, whereas others vary according to the date of official month's close. Thus, the No. 10 return is due to reach the General Superintendent on the 10th, whereas the expenditure estimates (Forms 293-5 and 213) should reach the Provincial Superintendent on the last Thursday but one. This difficulty is got over by use of a sliding panel.

The panel is divided into two heads, viz., Superintendent and Head Office, and hereon are entered returns, etc., due to leave on any specific *date*. At the left hand the month dates 1 to 31 are printed; a space is also provided for the name of the official responsible for making up. Should a return fall to be despatched on, say, the 9th of every third month, an entry would be made under the date and a remark to this effect put at the side.

The stationary portion is reserved for returns sent off on any weekday. At the extreme left are printed vertically the days of the week commencing with Friday. Provision is made for five weeks to allow of the panel being set at the first of each month against the correct weekday. In the case of a weekly report the entry appears five times under the respective days of the various weeks. Returns sent half-yearly or yearly are entered at the foot of the list. Any additions or deletions are made when necessary. The panel moves in grooves at both sides of the board and it is kept in position by a screw clamp operating upon a slotted iron support, which is screwed on to the foot of the board from the back.

The master list is under the charge of the correspondence clerk who consults it daily, advises the chief clerk in the event of non-despatch, and draws the attention of the official responsible for the omission.

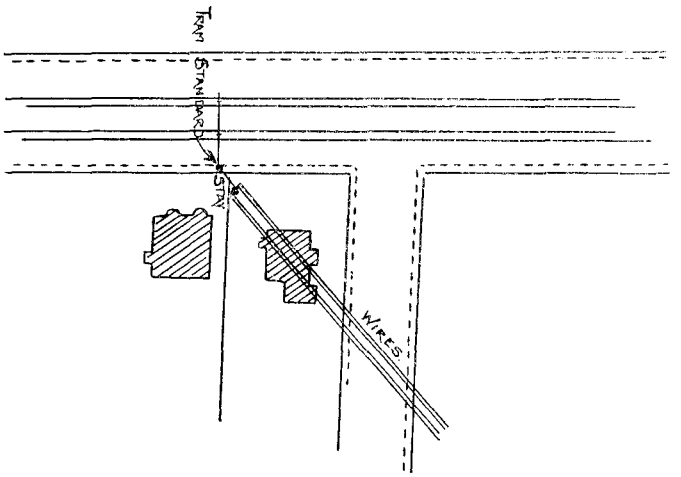
The same idea can be used departmentally.

AN ACCIDENT AND A WARNING.

BY E. HARPER, *Local Manager, Bournemouth.*

A MOST unusual accident occurred to an underground cable in Bournemouth a short time ago. Some six or seven years ago when the electric tramways were constructed, a small route, carrying a few wires, was put underground where it crossed the tramways, the cable terminating on the poles at either side of the road. In one case it was impossible to obtain the wayleave for the necessary back stay on private property, and the tramway authorities gave permission for it to be stayed back to the nearest tramway standard, which happened to be in the direct line of pull.

No trouble occurred with this arrangement until a few days ago, when the trolley arm of a car jumped the trolley wire, and the driver pulled up the car exactly at a point which caused the metal end of the trolley arm to connect the live wire with the trolley arm supporting it on the standard to which our stay was attached. This standard was not apparently connected to earth beyond that which it obtained through being set in cement in the ground. The



result was that a portion of the tramway current passed along our stay, which was touching the pot-head at the top of the pole, and thus found its way to earth along the lead sheathing of the cable, burning a hole about two inches long in the cable sheathing.

The first indication that anything had happened was a fall in the insulation of the cable, due to damp, about two or three days after the damage was first caused. No fuses were blown in the exchange, owing apparently to the fact that all the lines affected were well insulated at the exchange end.

The accident is of so unusual a character that it might not happen again for many years, but it will serve as a warning of the danger which might arise through using tramway standards as stay poles. To prevent further trouble in this case one of the tramway authorities' strain insulators has been inserted in the stay wire, owing to the impracticability of holding up the pole without this support. The rough sketch will illustrate the conditions.

CORRESPONDENCE.

TELEPHONE SOCIETIES.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I FEEL much obliged to Mr. Cohen, Mr. Blight and others for their valuable hints *re* telephone societies.

I however think that it should not be lost sight of that one of the main points of these societies is to bring together all classes of the telephone staff, so as to get the different branches into touch with each other, to understand each other's work, to exchange ideas, and so to bring about a better working of the staff as a whole. The success of these meetings largely depends on the presence of the district manager or other principal officials to introduce the lecturer and point the direction in which things should go, and also to give a few words of general advice all round.

From my own experience I find it does not do to make the subjects or papers dealt with too hard or complex, or the men look on them as a task and will not attend. The lectures should be made as interesting and manysided as possible by bringing in lectures and papers on other sciences, for nearly all sciences are useful to the telephone man. Those who have any interesting apparatus or instruments, or new dodges, should bring them along and explain them; it all helps and leads the mind into new channels.

The discussions that follow these papers and lectures give everyone a chance of picking up some good and useful points.

Again I would say, make these meetings as attractive and social as possible, for it is getting the different members of the staff together; and to know each other and work together seems to me to be the strong point in carrying on any business.

I well know that much has been done on the lines I mention, but I still think there is room for much more to be done in this direction.

Douglas, July 22. G. GILLMORE, District Manager, Isle of Man.

CODING OF EXCHANGES.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

THIS is a matter which I think should be considered from the point of view of traffic only. If any other consideration is taken into account there is a possibility of the second best code being chosen instead of the best.

That there can be a considerable divergence of opinion as to which is the best code is exemplified in the JOURNAL, where you will find various writers using M.R. and M.D. for Measured rate subscribers, and O.M.R., M.S. and M.E. for Message Rate subscribers; also locally we find the Post Office codes vary from the National.

A code should be both simple and obvious, so obvious that if it is quoted instead of the name of an exchange, there should not be the slightest doubt as to which exchange is meant.

A splendid example of good coding is shown by O.K., two letters which do not at all apply to "all correct," but are understood to mean that, and are in universal use.

The simplest code is to use the first letter of a name, but as some names in an area may have the same initial, a second or third letter must be added making the code obvious.

In an area such as Newcastle, where the Post Office have many exchanges, some of them with the same name as the National, the difficulty of coding is increased, and something must be added to the code to differentiate between exchanges. The Company has given the name of Central to the main exchange in several areas, the code for Central should therefore be the same in all areas.

After the Company has selected the best code, the question arises, "Can any further use be made of it than recording calls on tickets only?" I think we might go further and use the code for operating purposes such as, on junction pegs, "A" operators on split order wire, and "B" operators on ringing junctions. If this is possible (and I think it is) it leads us still another step. Can we drop the name of exchange altogether and simply retain the area name for trunk calls? Thus by giving each exchange in an area a letter instead of a name, the directory would read as follows:—

Subscribers Number.	Name.	Address.
A174	Abbott Memorial School	Gateshead
FS92	Abel, W. R.	Scottish Provident Buildings
A241	Abraham and Robinson	277, Cardigan Terrace
H140	Accident Hospital	Walker

and this would considerably simplify operating from both subscribers and operators' point of view, and would also code the exchanges and would, I believe, be an improvement on the present method of naming exchanges.

Central Exchange, Newcastle-on-Tyne, July 22. J. GWYTHER.

"REPLYING TO THE TELEPHONE."

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

WITH reference to Mr. P. H. C. Prentice's letter in the August issue, I should like to ask that gentleman why, if the method of giving a name immediately on answering the telephone is so desirable, he did not introduce this into the case that he furnished. Certainly the individual at the "Phœnix" who was asked if Mr. Russell was there would have been gratified to know who was asking for the information, and I think he would have been perfectly justified in refusing to give it until the identity of the caller was established. It is always advisable to remember that there are two parties concerned in every telephonic conversation.

Should not the name "as appearing in the telephone directory" have preceded "Is Mr. Russell there?" It appears that at least two of the remarks from each of the parties in the case that is objected to were due to the omission to give the name of the calling subscriber, which suggests the old adage "Those who live in glass houses should not throw stones."

7, Ashcroft Street, Oldham, Aug. 4. "AN ADMIRER OF SYSTEM."

LONDON NOTES—JUNE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

AFTER perusing the very peculiar effusion of "J. S." in the August issue I was inclined to treat it with indifference, but as others are interested a sense of duty urges me to make a brief reply.

As "J. S.'s" original remarks appeared to be a reflection on the very loyal body of workers at Nottingham Factory, I ventured to ask for further information. My simple question was, "Has 'J. S.' ever visited Nottingham Factory?" If not, he is not qualified to make any comparison. To this "J. S." is unable to make a reply, and, being in this unhappy position, endeavours to cover up his confusion in a flood of words, newspaper cuttings, etc., entirely irrelevant to the subject.

With these observations the matter, so far as I am concerned, is closed.

Nottingham Factory, Aug. 5. CHAS. E. FENTON.

A CORRESPONDENT, signing himself "Lochaber," writes in reference to this controversy:

Let there be competition between factory and workshop by all means—it is good for the Company that there should be such, but let it be healthy competition. Let them carry out Goethe's advice, and lend their hands to each other, "gern und willig," as friends who would journey and strive with each other in the same cause.

As a stores clerk I have had considerable experience of the ever ready hand held out by "the powers that be" at the factory to help a district in time of urgent need, and the workshops have certainly a good pacer in their older friends, who, let us hope, will still keep up the pace.

As before remarked, and always having the presumption to presume things, correspondence between "powers" in such terms is to be deplored; and to come from the sublime Goethe to the ridiculous George Robey—"It's a pity!"

[This correspondence must now cease.—ED., N. T. J.]

A TELEPHONE ENQUIRERS' NOTE BOOK.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

KNOWING that the staff of the National Telephone Company are always eager to obtain any literature dealing with their business, I wish to call your attention to a book I have seen advertised in some recent technical journals, "*The Telephone and Telegraph Engineer's Pocket Book*; a handy reference book for all persons interested in Telephone and Telegraph Systems, by International Correspondence Schools, Scranton, Pa.

I am quoting a few extracts in case any of your readers may be in doubt whether to subscribe or not. The extracts may help them to decide.

Page 281.—Common faults and their remedies: "In the case of a defective instrument the best thing to do is to return it to the dealers for repair."

I am still trying to find the Scranton method of clearing a short circuit in a branching multiple. But the little book is silent.

Again, "The simplest way to test the battery is to try a new battery and see whether it will make the telephone work properly; if it does the trouble was with the old one."

Page 282.—"If any coils in the instrument have been damaged by lighting, the smell of the charred insulation can frequently be detected when the door of the telephone is opened."

Page 172.—Storage cells: "Each cell should be examined regularly at least once a month for voltage, and by looking between all the plates for material lodged there."

Page 159.—Leclanché cells: "The jars usually have printed directions (which should be followed) pasted upon them for setting up the cells."

Page 285.—"Poor hook switch contacts: Retempering the spring. The latter may be done by bringing the spring to a red heat, and then dropping it into water." The "poor" german silver spring has my sympathy.

"One way to test a magneto-generator consists in placing the fingers across the terminals and turning the crank."

Page 286.—It is stated that an inspector should carry an "8-oz. weight for testing strength of receiver magnets."

I will conclude with one more quotation.

Page 287.—Causes of noises in telephone circuits: "The sudden shifting of the earth's magnetic field may induce currents in the line which will cause sounds in the receiver." I can imagine a linesman informing the test clerk that the trouble is *not* an H.R. and that he is coming into the stores for a stay wire to anchor the earth's magnetic field. B. B. JOHNSON.

Anglo-Portuguese Telephone Company, Lisbon, Aug. 13, 1909.

TELEPHONING FREE OF CHARGE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

IT often happens that a contract officer has trouble to persuade a person to become a subscriber on account of that person being allowed by some subscriber to make use of his telephone without charge. Such a case was brought to notice recently in this district, the subscriber being on the unlimited rate. A notice (Form No. 1,109), which points out that such practices are a violation of the subscriber's agreement with the Company, etc., was sent to the subscriber, with the result that he discontinued the practice complained of, and it is interesting to record that in the immediate vicinity of this subscriber's premises three orders were obtained by the contract officer during the next week.

Dover, Aug. 18. E. F. FOSTER, Contract Clerk.

PRIVATE BRANCH EXCHANGE TESTIMONIALS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

CARDIFF this year has received some exceedingly useful testimonials from users of private branch exchanges. These are being printed and circulated in the district.

There is no doubt as to the fighting power of *local* testimonials, especially when these emanate from important and successful firms, and the above should furnish Cardiff with a splendid impetus to increase considerably the private branch exchange returns.

It may not infrequently be urged by prospective subscribers that what may prove beneficial in, say, Liverpool, will not be of service in Birmingham, but this argument is destroyed if testimonials from people in the same town or locality are forthcoming. These very often "wake the subscriber up"; he has a respectful regard for the business methods of his successful neighbour or rival, and it is in gently plying this fact that the contract officer is likely to score.

Head Office, Aug. 17. H. H. THOMSON.

NEWS OF THE STAFF.

Mr. and Mrs. J. D. W. STEWART were presented by the Edinburgh district staff and one outside friend (Mr. Spence) with a silver rose bowl on the occasion of Mr. Stewart's transfer to Belfast. Mr. D. McIntosh, Engineer, made the presentation to Mr. Stewart, and Mr. J. L. Magrath, Contract Manager, also expressed the esteem in which Mr. and Mrs. Stewart are held in the district. The Ampère Golf Club presented Mr. Stewart with a miniature reproduction of the medal which he gave to the club as first president.

Mr. A. LYNN, Chief Clerk, Superintendent for Ireland's Office, has been promoted to the position of Chief Clerk, Cork.

Mr. R. SURPLICE has been transferred to the position of Chief Clerk, Superintendent for Ireland's Office.

Mr. T. C. HONEYWILL, Storekeeper, Newport, who has been promoted to be Storekeeper at Bristol, was presented by the staff with a set of carvers. The presentation was made by Mr. Williamson, the Local Manager.

Mr. J. D. PIERREPONT, Sub-Engineer, Nottingham, left the Company's service on July 22 to take up the position of Assistant Manager with the Oriental Telephone Company, Singapore. The Nottingham staff presented him with a 10-inch slide rule and a Swan fountain pen, Mr. Sibley, the District Manager, making the presentation, and at the same time wishing him success on behalf of the staff in his new appointment.

Miss G. M. PELL, Correspondence Clerk, Nottingham, resigned the Company's service on Aug. 5, and was presented with a silver purse by her colleagues in the district office.

Miss M. HOOLEY, Senior Operator, Nottingham Central Exchange, has been promoted to be Supervisor.

Inspector D. S. CLAYSON, Nottingham, has obtained a City and Guilds second-class certificate for telephony in the honours grade.

Inspector E. ROBINSON, Nottingham, has obtained a City and Guilds first-class certificate for telephony, ordinary grade, and also a first-class certificate for electrical engineering, ordinary grade,

Mr. JAMES GRAHAM, Chief Inspector at Edinburgh, has been graded Assistant Electrician.

Inspector B. H. GREGORY, Jersey, was, upon his leaving to take up a position with the Post Office Engineering Department in London, presented by the District Manager (Mr. Eady), on behalf of the various sections of the internal staff, with a fitted dressing case as a mark of esteem.

Mr. JAMES PATON, Faultsman, Kilmarnock, who has been eleven years in the Ayrshire district, was presented with a silver watch and travelling bag on the occasion of his transfer to Aberdeen district in a similar capacity. The presentation was made by the District Manager.

Miss MARGARET WILKEN, Operator, North Exchange, has been transferred as Clerk to the Rentals Department, Salisbury House.

Mr. F. T. RAPPS, Local Engineer's Clerk, Woolwich, has been transferred to the Statistical Office, Salisbury House.

Mr. R. SINCLAIR, Wayleave Officer, Westminster, has been promoted to be Assistant Engineer, Westminster.

Miss GLADYS MURIEL LEACH, Operator at Burnley, has left the Company's service owing to her parents having left the town. The staff of the area presented her with a silver-backed hair brush as a memento.

Miss THIRZA DUNKERLEY, Senior Operator, Manchester, left the Company's service on June 26. Before leaving she was the recipient of a handsome gold bangle from the staff of the Central and City Exchanges.

Instrument Inspector DOUGLAS, Newcastle, has resigned in order to emigrate to Boston, U.S.A.

Miss JESSIE S. PAIRMAN, Newcastle, has been promoted from the position of Supervisor to that of Travelling Supervisor for the district.

Mr. A. J. WAUGH, late Line Foreman, Newcastle, has been appointed in a similar capacity in connection with the telegraph work on the extension of the Lagos railway in Southern Nigeria, and sails this month. The appointment carries with it an annual salary of £250. Mr. Waugh was lately in the employment of the Post Office.

MR. FRAME, Exchange Manager in Training, Glasgow district, has been appointed Traffic Manager, Greenock district, and Mr. GEORGE EDWARD, Assistant Ledger Clerk, Glasgow district, is now Exchange Manager in Training.

Mr. ROBERT B. CRUM, Exchange Manager, Hillhead Exchange, Glasgow, has been promoted to be Assistant Traffic Manager, Glasgow district.

Mr. CHARLES N. CARTER, Exchange Manager, Royal Exchange, Glasgow, has been transferred in the same capacity to Hillhead Exchange, Glasgow.

Miss ELIZABETH HIGGINS, lately Clerk-in-Charge, Bridgeton Exchange, Glasgow, has re-entered the Company's service as Clerk-in-Charge, Gorbals Exchange, Glasgow.

Mr. R. B. BUCKERIDGE, Engineer's Office, Glasgow, has passed the associates' examination of the Chartered Institute of Secretaries held in June of this year.

Mrs. BENNETT, of the Electro-Plating Department, Nottingham Factory, on leaving after five and a half-year's service, was presented by Mr. A. J. Bone, on behalf of the department, with a gold brooch and locket.

Mr. W. HARDING, of the Engineer-in-Chief's staff, was elected on June 29 last as an associate of the American Institute of Electrical Engineers.

Mr. J. W. WHEELER, of the Engineer-in-Chief's staff, who passed first class in the recent City and Guilds examination in honours (telephony) has received the silver medal of the institute and the first prize of £3. Last year Mr. Wheeler passed first class in ordinary (telephony), and was awarded the bronze medal and the second prize of £1.

Miss ANNIE BARRACLOUGH, Sheffield, has been promoted from Operator to Supervisor.

Miss M. CARR has been appointed Travelling Supervisor for the Sheffield district.

Mr. F. SMITH has been appointed Traffic Manager's Clerk, Sheffield.

Miss THOMSON, Operator-in-Charge, Goole, has been promoted to Travelling Supervisor for the East Yorkshire District.

Miss ANNIE THOMSON, Supervisor, Royal Exchange, Glasgow, has been appointed Senior Supervisor in the same exchange, vice Miss Robertson, resigned.

Miss ELIZA TELFER, Operator, Bridgeton Exchange, Glasgow, has been appointed Supervisor, Royal Exchange, vice Miss Thomson.

London Traffic Department.—*Promotions and Transfers:*

Miss AMY BESANT, Operator, Avenue, has been promoted to be Supervisor at Paddington.

Miss EDITH PENNETT, Operator, London Wall, has been promoted to be Supervisor at Holborn.

Miss ALICE EYRE, Operator, Gerrard, has been promoted to be Supervisor at Holborn.

Miss ELIZABETH DYKE, Operator, Kensington, has been promoted to be Supervisor at Gerrard.

Miss ALICE BRADLEY, Supervisor, Paddington, has been transferred as Supervisor to Gerrard.

On Mr. A. WARE's leaving East Exchange to take over his new appointment as Exchange Manager, New Cross, he was presented with a leather dispatch case by the members of the East traffic staff.

Miss DOROTHY H. COLLAR, Operator at Stratford, on being transferred to Croydon was presented by her late colleagues with a butter dish and fruit stand.

Miss LIZZIE GILBERT, the Cook at London Wall, who has left after nine years' service on account of ill-health, was presented by the London Wall staff with a purse containing 29*s*.

MARRIAGES.

Mr. J. W. HOLMES of the Contract Department, Belfast, was married on July 10, and was presented by the staff with a marble clock. The presentation was made by Mr. Gilmour, the District Manager, who expressed the good wishes of the staff.

Mr. G. C. PEARSON, Instrument Fitter, Wall Set Department, Nottingham Factory, was the recipient of a handsome curb, subscribed for by his colleagues, on the occasion of his marriage on Aug. 4, Mr. G. Garner, Foreman, making the presentation.

Mr. E. CLISSOLD, Lineman Inspector, Walsall, was presented with a handsome old English bracket timepiece on the occasion of his marriage on June 26. The presentation was made by Mr. R. S. Grosvenor, Local Manager, on behalf of the staff.

Miss MABEL E. BOYER, Operator, Whitchurch (Cardiff), has resigned the service in view of her approaching marriage. Miss Boyer has been in the service since January, 1904, and has served the Company in a very efficient and faithful manner. The Clerk-in-Charge, on behalf of the operating staff at Cardiff, presented her with an electro-plated toast rack and sugar sifter as a mark of respect and with best wishes for her future health and happiness.

Mr. T. H. BUTLER of the Share Department, Secretary's Office, was married on Aug. 14. He was presented with a marble clock and two pipes by the staff at Head Office.

Miss A. METCALFE, Senior Clerk of the Trunk Fees Department, Newcastle, resigned the service on Aug. 19 to be married. She was the recipient of an electro-plated cake dish and a pair of silver serviette rings as a token of the high esteem in which she was held by members of the Newcastle staff.

Miss ALICE N. WHITE, Clerk in-Charge, Gorbals Exchange, Glasgow, left the Company's service on Aug. 12 to be married. She was presented with a barometer by the staff in her exchange.

Mr. JOHN F. STEWART, Contract Department, Glasgow, was presented by the staff with a handsome marble timepiece on the occasion of his marriage on July 16. Mr. Brown, Contract Manager, made the presentation before a large number of the staff.

Miss ALICE MELOY, Portsmouth, who has left the Company's service to be married, was presented with a tea service by the members of the operating staff.

Miss JANET ROBERTSON, Senior Supervisor, Royal Exchange, Glasgow, left the service on Aug. 19 to be married. She was presented with a very handsome case of cutlery by the staff in her exchange, which they asked her to accept with their good wishes.

Mr. A. SMITH, of the Engineer-in-Chief's Department, Nottingham Factory, was presented by Mr. Briggs, on behalf of the combined staffs at the factory, with a handsome clock, pair of etchings and siver-plated jam dish on the occasion of his marriage, which took place on July 31.

Miss KATE BINT, Operator, Central Exchange, Birmingham, resigned on Aug. 12 to be married after six and a half years' service with the Company. She was presented with a silver cake basket and knife by her colleagues in the exchange.

Miss MARY CARTER, Operator, Sheffield, left the Company's service on Aug. 5 to be married and was presented with an electro-plated teapot by the operating staff.

Miss LAURA SOUTH, Sheffield, left the Company's service on Aug. 5 to be married, and was presented with a cruet as an earnest of the good wishes of the operating staff.

London Traffic Department.—*Resigning to be Married:*

Miss CONSTANCE SMITH, Senior Superior at North Exchange, who resigned on Aug. 19 after twenty years' service, was presented with a case of silver teaspoons and salad servers, by the North Operating and Maintenance Staff and past colleagues who are now at other exchanges.

Miss CHARLOTTE NOAKES and Miss ROSA PRIEST, both Supervisors at Holborn, were presented on leaving with a set of carvers and a jam dish; and a dinner service and rose bowl respectively by the Holborn staff.

Miss VICTORIA BARTLETT, Supervisor, Gerrard, was presented with a dinner service by the operating staff.

Miss ETHEL CHENNELLS, Operator at North Exchange, who left on July 22, was presented by the operating staff with a silver-plated teapot.

Miss MAUDE WOOLF, Operator at the same exchange, who resigned on Aug. 12, was presented with a case of silver fruit knives and forks. The maintenance staff at North and a few friends who had been transferred to other exchanges joined with the operating staff in the gift.

Miss GLADYS MARTIN, Operator, Croydon, was presented by the Croydon staff with a handsome set of carvers.

Miss LILY WOOD, Operator, Gerrard, was presented with a case of fish knives and forks.

Miss NELLIE CHAPMAN, Senior Operator and Caterer, Avenue, was presented by the staff with a dinner service on leaving to be married. Miss Chapman, who was very popular with her colleagues, was the recipient of many other presents, among which were a teapot, jam dish, dessert dishes, table centre, vases, doylies, duchess set, jam jar, cheese dish, and a royal Doulton hot-water jug, etc.

Miss LILIAN BUDGEN, Operator, Avenue, was presented by the staff with a fire screen on leaving to be married.

OBITUARY.

We regret to record the death of Gunner ERNEST ARTHUR SNOW, Night Watchman-Inspector, Kensington, and a member of the Territorial Forces, who was killed by a motor car on Salisbury Plain, whilst on march, under circumstances now familiar to most of our readers. The funeral, which took place on Aug. 18 at Nunhead Cemetery, where military honours were accorded, was of an impressive character. Six of Mr. Snow's fellow-gunners carried the coffin to the gun-carriage on which it was borne to the grave, accompanied by more than 200 soldiers, who included the following members of the Company's staff—Messrs. Hardstone, Howe, Doughty, Bothwell, Smith, Stowell, Darby and Bees, all of whom are Territorials. The last two were actually marching in the same company as Gunner Snow at the time of the mishap. Nearly 50 wreaths were sent, including one from his colleagues on the National staff.

We regret to report the death of Miss GEMMILL, who has been Operator and Caretaker in the Company's service at Renfrew, in the Greenock district, for the past eighteen years. During her term of service with the Company she gained the complete confidence of the subscribers on her exchange, and a complaint regarding the operating there was a thing unknown. She retired in June last for the purpose of undergoing an operation, and had recently been transferred to the Paisley Infirmary, pending her removal to the Home for Incurables, but she had a serious relapse on the morning of Aug. 4 and passed peacefully away. The members of the staff in the Paisley centre subscribed for a handsome wreath, and the Company was represented at the funeral by Miss Sherden, Acting Clerk-in-Charge, Paisley.

STAFF GATHERINGS AND SPORTS.

Portsmouth.—On Aug. 7 the Portsmouth and district operators and their friends had a very enjoyable river trip to Beaulieu. The steamship *Duke of York* was chartered and the party, which included Mr. S. J. Smith, District Manager, were met by Lord Montagu of Beaulieu, who had very kindly given permission to go over his beautiful estate on the borders of the New Forest. Tea was provided on the green and games were indulged in. The abbey was visited by some of the party, while a cricket match was played by others. A very pleasurable afternoon was spent, the party numbering upwards of 80.

Dublin.—The annual staff excursion took place on Aug. 14 to "The Scalp," co. Wicklow. A start was made at one o'clock from the Central Exchange, and after a three hours' drive "The Scalp" was reached, where tea was partaken of by close on 150 members of the staff. The sports, which were an outstanding feature of the outing, were very keenly contested; particularly the ladies' races, which were very close and exciting, while the sack race (100 yards), jump, Siamese race, and tug-of-war kept the male portion of the assembly in high spirits. The prizes were distributed by Mr. P. F. Currall, District Manager, after which dancing and singing were indulged in for some time. Amongst those present were Mr. F. Cowley (Superintendent for Ireland) and Mrs. Cowley, Mr. P. F. Currall (District Manager), Mr. C. H. Redhead (Engineer), Mr. R. Morgan (Traffic Manager) and Mrs. Morgan, and Mr. Wallace. The committee in charge of arrangements were Messrs. McShane (hon. secretary), Purcell, Earle, Doyle, Borland, McEnerney, Dalton and Miss Seery.

Dundee.—The district staff held their annual picnic on July 3 at Lindores, permission having been kindly granted by Mr. F. L. Maitland. The company, numbering about 90 and representative of all departments, was conveyed by special train. A very enjoyable afternoon was spent in games, racing and other pursuits. The prizes for the races were given by the heads of staff, and were presented to the winners by Mr. W. Brown (District Manager) and Mrs. Brown.

Perth Centre.—The first picnic organised by this centre took place on July 17 to Cluny Loch and Castle. The company numbered about 40, including Mr. Burnside (Local Manager) and Mrs. Burnside, staff from outlying exchanges, Dundee, and from Perth Post Office. During the afternoon games and boating on the loch were engaged in. The outing was most enjoyable notwithstanding a "Scotch mist" falling during part of the homeward journey.

Nottingham.—*Cricket Match.*—A match was played between the Nottingham and Sheffield district staffs on the Victoria Embankment grounds, Nottingham, on July 24. Nottingham scored 64 and Sheffield 70 for six wickets. C. Marsden, of Sheffield, made 37 not out and took four wickets for twenty runs.

East Kent.—A picnic of the combined staffs of this district was held on July 24 at Eastry; the journey being made from the various centres by brakes and motor coaches. During the afternoon a cricket match, Isle of Thanet and Canterbury *v.* Dover and Folkestone, resulted in a decisive victory for the latter. Running and other sports then took place, the competition in several events being very keen, especially the last event, namely, tea, in which all acquitted themselves most creditably. The prizes, kindly given by the District Manager, Local Managers and other members of the staff, were afterwards presented by the District Manager. Singing and dancing on the lawn were then enjoyed until nine o'clock, when a pleasant ride home completed what was unanimously voted a most enjoyable outing.

Blackburn.—On June 26 the staff had a most enjoyable outing to Worston. Train was taken to Whalley, whence the party, who were joined there by Mr. and Mrs. Remington, proceeded in chars-a-banc to Worston, *via* Mytton, Eddisford Bridge, Waddington and Sawley. On arriving at Worston an excellent tea was served at the "Calf's Head" Hotel. After the party were photographed and various games had been engaged in the homeward journey was resumed.

London.—*Night Operators' Cricket Match.*—There was a large gathering of night operators and friends at Battersea Park on July 5, when the return match took place between the night operators of the General Post Office and those of the National Telephone Company. The play was of a much more even character than the last, and the National Telephone Company won a good game by 29 runs. After the match tea was served in the pavilion where the two staffs mingled together in a friendly spirit, and a thoroughly pleasant afternoon closed with the hope on both sides that another meeting would take place at an early date. The hon. secretary of the Pelican Cricket Club (night operators) will be pleased to hear from any teams with open dates (mid week) for next season. All letters to be addressed to hon. secretary, 24, Westmoreland Place, Pimlico, S.W.

Nottingham Factory.—The Electro-Plating Department and friends, to the number of 56, held their annual outing on July 27 at Normanton-on-Soar. Splendid weather prevailing, a most enjoyable time was spent in games and other diversions.

Edinburgh.—About 60 of the Edinburgh district staff engaged in a ramble on July 31. The route this time was by steamer to Aberdour, thence, walking, to Burntisland, along the coast of Fife. Tea was taken at Burntisland before crossing the ferry for home.

Sheffield.—About 50 members of the staff visited Liverpool and New Brighton on Aug. 14. Through the courtesy of Mr. Hidden, the District Manager of Liverpool and Birkenhead, three members of his staff (Messrs. Thompson and Miss Jones, the matron) volunteered their services in showing the party some of the sights of the city, special arrangements having been made to see over the Cotton Exchange. After tea the bulk of the party visited New Brighton, where a very pleasant time was spent. The kindly interest of the Liverpool members of the staff was thoroughly appreciated by the Sheffield visitors.

Southampton.—The operators at this centre arranged their annual picnic for Aug. 16, when a party of 40 spent an enjoyable afternoon in the New Forest. After tea in the shade of the trees and an attractive sports programme the party finally dispersed at 9 p.m.

LOCAL TELEPHONE SOCIETIES.

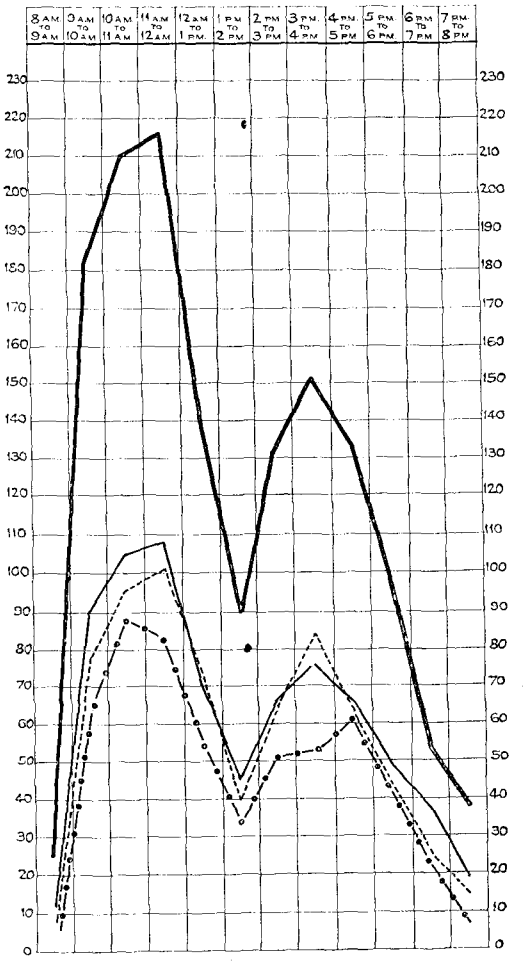
Exeter.—The annual meeting of this society was held on Aug. 6. The following officers were elected for the ensuing session:—President, Mr. R. A. Dalzell; vice-president, Mr. H. Reid; committee, Miss C. Hatten and Miss A. Lewis, Mr. W. Sim, Mr. P. Humphriss, Mr. H. Martin, and Mr. F. Bennett; secretary and treasurer, Mr. F. Squire.

PUBLIC TELEPHONE WORK AT PADDINGTON.

MR. E. J. COLLIER, writing in the *Great Western Railway Magazine* on the above subject, says: The accompanying curves show the public telephone work at Paddington Station on July 1, a day when there would not be exceptional pressure, such as that preceding a Bank Holiday for instance, but just ordinary work.

The thick line shows hour by hour the total number of calls, including: (1) Originating calls—that is, calls made from Paddington; (2) incoming calls—calls made to Paddington Station; and (3) intercommunication calls—made from one extension to another. It will be noticed that between 8 a.m. and 9 a.m. the work is not particularly heavy, the total reaching only about 25 calls. . . . Between 9 and 10, however, there is a heavy rise, and a further increase between 10 and 11, the highest peak being reached between 11 and 12. A considerable fall occurs between 12 and 1 and the luncheon hour can be easily determined by a glance at the work between 1 and 2, the lowest point reached between 9 a.m. and 6 p.m., the normal hours of duty. Curiously enough, this curve takes practically the same course as almost every curve of telephone work in London and the provinces. After the luncheon interval the work goes up again and reaches its highest point between 3 p.m. and 4 p.m. There is nearly as much work between 4 and 5, but from that hour there is a steady downward tendency, although at the lowest point—between 7 and 8—nearly 40 calls are dealt with.

The thin line shows the number of calls handled by each operator. It will be observed that at the busiest hour the average was nearly 110 calls each, or about one every 33 seconds. This comparison is exceedingly useful in telephone and telegraph work, as it can be seen at a glance whether there is sufficient staff—neither more nor less—to cope with the work, the fluctuating nature of which renders it difficult at times to gauge the strength required.



Thick line, total calls. Thin line, average calls for operator. Dotted line, incoming calls. Strokes and circles, outgoing calls.

[Reproduced by permission of the G. W. R. Magazine.

The dotted line represents the incoming calls, and the lowest line—strokes and circles—outgoing calls. . . . The highest total number of calls per hour is 215, which represents one every 17 seconds.

A word in conclusion respecting the use of curves for ordinary business purposes. An objection sometimes raised is that they occupy a long time in preparation, but too much is often made of this. Care is, of course, essential, but when once started, it is a simple matter to draw a straight line (daily, for instance), and the graphic result obtained is much more easily followed than a bewildering array of figures. The most important point is that the information is usually required by the chief officers, whose valuable time need not be wasted in wearily wading through figures when a curve will convey to them at a glance what they require to know—viz., the comparative rise and fall of work, traffic, etc.

HULL BOARD OF EDUCATION EXAMINATIONS.

AMONG the successes recently published appear the following names:—

Magnetism and Electricity—

Stage 2, second class: Frederick Slingsby, Herbert Norfolk.

Stage 3, second class: Arthur Akester.

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TELEPHONE MEN.

XLI.—CHARLES SWAIN AGNEW.

CHARLES SWAIN AGNEW is a well-known citizen of Manchester and was born at Richmond Hill, Salford, in 1836. He is a brother of Sir William Agnew, the famous art critic; another brother being John Henry Agnew, who was one of the first directors of the Lancashire and Cheshire Telephonic Exchange Company, which, in the early eighties, worked the Bell patents in the north-west of England, and who was also a director of the United Telephone Company, and with whom for many years Mr. Agnew was an earnest co-worker in telephonic matters.

Mr. Agnew is one of the Company's oldest Directors and has been associated with the development of the telephone system ever since its embryo stage in the United Kingdom.

He assisted in the establishment of the first Manchester telephone exchange in Faulkner Street in 1879, and on the retirement of his brother, John Henry Agnew, through failing health, took his place on the Lancashire and Cheshire board in 1883. He was prominently associated in the negotiations which terminated in the fusion of that Company with the National, of which he has been a Director ever since the great amalgamation in 1889. He is also a member of the Lancashire and Cheshire Local Board.

Mr. Agnew, in conjunction with the late Mr. Heyworth, extended the telephone to Blackburn, Bolton and other manufacturing towns in that district, to say nothing of the pioneer work which was done with the aid of his own widespread business connections throughout East Lancashire.

He and Mr. Heyworth took an active part in the management of the Lancashire telephone service, and Mr. Agnew has vivid recollections of dealing with the subscribers of those days, and many difficult wayleave questions were solved with the help of his influence and experience. In the later years of the Lancashire and Cheshire Company there were about 1,400 subscribers in Manchester; the number of the stations now served by the National Company is 22,296, and in the development of this enormous system Mr. Agnew has played a very considerable rôle. Apart from telephone matters, Mr. Agnew has all his life been greatly interested in hospital work, and has been for many years associated with the Royal Eye Hospital in Manchester, one of the first institutions of the kind in the kingdom. He was one of the originators of the great Exhibition in Manchester in 1887, and an active member of the executive committee, which handed over to the trustees of the Whitworth Institute the handsome surplus of upwards of £43,000, to be appropriated towards the building and equipment of a technical school, and to the purchase of decorative and fine art objects of the highest class to be placed in the Whitworth Galleries. He was a director of the Manchester Chamber of Commerce for twenty years, retiring last year. Mr. Agnew has travelled in the United States, where he had many interesting experiences of the American Civil War, 1861-5. He has also visited Canada and India and other countries.

In his younger days he was an active politician and worked hard for the Liberal party in South-East Lancashire. He is a staunch free trader, and vividly remembers the rejoicings and procession of trades which marched through Manchester after the repeal of the Corn Laws in 1846.

IMPROVEMENT.*

BY F. V. SQUIRE, *Chief Clerk, Exeter.*

THE title of my paper is "Improvement," and I have written it with the object of directing attention to a few matters in which it is possible by thought, study and reason to improve our output, *i.e.*, the class, quality and quantity of the work which engages our lives, and thereby make us more efficient workers, with resultant satisfaction to ourselves and to the Company.

Difficulties there are, as the majority of telephone workers know; but many a man's path is blocked by difficulties which he himself has created, and which he can remove by overcoming his own faults and weaknesses.

A dictionary will tell us that the definition of the word improvement is "advancement from good to better." Now, most of us are prepared to argue, I expect, that our work is good, notwithstanding the opinion that may sometimes be expressed to the contrary. Now, the point is: Are we content to remain at "good"—is there not something higher to attain? Should we not by aptitude and application make the result of our work "better" or even excellent? We were not content in our early days to have our exercises marked up as good; we strove to get them marked "very good" and then "excellent." If we bring that spirit to our work improvement will result, with a measure of that satisfaction before mentioned. Temperament or physical disability may be against us, but will-power can be cultivated and will help to overcome these defects. Ill-luck may attend us for a time, but a man exhibits just as fine a quality of courage when he smiles and doggedly tries to improve as when he braves the dangers of a battlefield.

Now, in what way may we show improvement? We will start with those of us who get first in touch with the public—contract men or canvassing staff. It would benefit us occasionally to direct a thought here. There are men we know employed solely in this duty, but may not those of us who are engaged in other departments do something? Does not occasion arise when any one of us, perhaps after working hours, happen to be in touch with someone of the public who is not a telephone service user, but who we think should be? The topic sometimes turns on telephone service; what is our attitude then? Is it that of an enthusiast who is ever ready to join in the conversation with a word of praise and a recommendation to a waverer; or on the other hand do we hold aloof with a thought that our day's work is done and telephone service is at our back for the time being? If we are enthusiasts in the true sense, we shall be as ready in quoting service rates and as conversant with them as we are in running over that portion of our early learning, the multiplication tables. "New business" should be our barometer. When we simply retain what we have, it is set very dull and wet. When business is good and we make reasonable progress, it is set fair. If we set our pointer and there is no wavering from fair, be sure the result of our enthusiasm is here, our occasional backing up of the contract staff has borne fruit. Enthusiasm will make those of us of ordinary ability, but of mighty enthusiasm, rise to an emergency better than men of great knowledge, who lack the power to put their whole energy into a purpose. It isn't so much what a man knows as the degree of energy with which he applies his knowledge that will count in results.

Then, as to this new business of which I have been speaking; we hear of cramped conditions, etc., and may ask whether all and sundry can be expected to allow their enthusiasm to burst forth in face of these conditions. I say let not that worry us. Business must be remunerative, or it falls short of the meaning of the word. Turn over and get to the bottom of what there is to be turned over in the way of those that live in ignorance of the value of telephone service, and we shall have done our part; rejected orders will be infinitesimal. There is one point which I must emphasise just here: "Misrepresentation." Know the service and the rates; succeed or fail with a prospect on that knowledge; but misrepresent nothing. Misrepresentation is only a bubble that is easily pricked, and is neither satisfactory to the user nor to the person to whom it is used.

What ensures a good service? I am not competent to deal with or criticise the engineering or electrical branches of the business, but this I can say that if there are slipshod methods or careless work existing, it is next to impossible to give that service which we know it is requisite to give. If there does exist anything which should not in either of these branches I hope someone more competent in this particular than I am will mention it. To know that things may not be quite right and yet fail to apply a remedy is to live in a fool's paradise.

The next point applies to the office. What can be done here to ensure a good service? I think little directly, but indirectly much. The office is not concerned with the actual construction or maintenance of subscribers' circuits, or with actual traffic, but here can be exercised considerable influence for good or ill on a subscriber's judgment on the service. Enquiries of all kinds are made of the office, and if these are not dealt with satisfactorily from a subscriber's point of view, service and administration are coupled together by him and both condemned. All office communications with the public and subscribers should be dealt with courteously, promptly and accurately. Courteously, because courtesy is due to the public from a public service, and mainly because a courteous manner is like a suit of armour, it protects one from the barbed sarcasms, cynicisms and pointed personalities of a perhaps irritated member of the public who fancies he has, and perhaps has a grievance, and wants to argue or quarrel about it. It is impossible to keep on abusing a man who is persistently courteous in manner. Therefore if any of us are curt, show improvement and adopt the courteous manner.

Then communication should be dealt with promptly. In all telephone workers the virtue of being prompt should be apparent. We work the fastest service in the world. There is nothing else whereby one gets so rapidly in direct touch with the great mass of people as by the telephone. Now are we as prompt as we might be? Let us ask the question of ourselves individually: Is there not room for improvement? The subscriber gets a prompt answer from the exchange when calling the office, and the office reply should be equally prompt. Then under this heading I think the matter of promises and appointments arises. We must endeavour by all means to keep these—what a lost bone is to a dog so is a broken promise to the public.

Now as to accuracy. We all agree I hope that there is nothing so damaging to our business reputation as something inaccurately proffered. We do make mistakes sometimes, but having made them, do we ever trouble to analyse the cause of them? If so, I feel sure you will agree there is room for improvement, for of all mistakes, the greater number is caused by carelessness. Do we ever give a thought to the cost of our mistakes, and do we really regret them, or do we treat them as inevitable? Bear in mind the Company is judged by subscribers on our dealings with them, and if we are not accurate, what is the result? What is more irritating to the receiver and humiliating to the giver than inaccurate information.

Lastly, in our thoughts on ensuring good service we come to the switchroom staff. Energetic contract men, expert engineers and electricians, a prompt, courteous office staff, all watched by the management, have built up the system to ensure an excellent service, and then it really fails owing to a temporary lapse on the operator's part. Now operators, what can you do to show improvement in this respect. It is, I know, very difficult to say, but do you apply yourselves to your duties as you might, are you fixed to your positions with inefficient thought of what is necessary at the moment? Your aberration may be momentary, but remember the service is judged in seconds; are you too machine-like? I mean, just an automaton and not a thinking machine. (There is a very good paper on this matter in the March JOURNAL by a Cardiff operator). Is supervision lacking? Does either of these points hit the mark, and if so, what is the remedy. I feel sure there is room for improvement, for the ideal service has not been attained.

You are charged with the duty of handing over the finished article, the service for which the subscriber pays, and if you fail, then, in the subscriber's judgment, we all fail.

I will now pass on to the works order.

The works order is a most important thing in the Company's administrative system. What is its course? Issued from the

* Slightly abridged from a paper read before the Exeter Telephone Society.

district office it finds its way to the local offices where the men charged with the duty of carrying out the various works will plan and scheme to proceed with these works in the most economical manner consistent with efficiency. Having planned and set out the necessary work the construction or maintenance men receive the order to proceed. Someone will say it is very easy to talk glibly of planning and scheming, but it wants some doing—I know it, there are difficulties of all descriptions—we have all heard of property owners and urban councillors who look on a company such as ours somewhat as a mine from which gold may be drawn, more often than not they are disappointed, but they cause trouble and difficulties. These difficulties, however, should be faced calmly, their conquest should be our pleasure, remember half of us would not be here if such difficulties did not exist.

Now the construction and maintenance men being set to work, what is needed? I say careful supervision, good work and accuracy. The willing and conscientious worker does not mind being supervised, he has the satisfaction of knowing that the result of his labour is bound to be noticed, he has no scruples about the attention of a supervisor, he rather welcomes it in the assurance that he has the opportunity of proving his ability. With the skulker it is just the reverse. Can we improve the supervision? Then as to good work, it is known that we all are capable of good work, or we should not be in our present positions. But is our work always good? Being capable of good work and doing good work are different things; really there is room for improvement here. We sometimes put our ability on a pinnacle and say, "I am capable of that." Well, if that is the case, let us work up to it; it is our duty to do so. If we are proud people and glory in our ability we ought not to be content to put out anything less than our best effort and best work.

Then, accuracy. During the progress of these works hundreds of points arise demanding accuracy. Wayleaves are secured which probably are granted on particular conditions; such conditions must be carefully noted and carried out. Apparatus has to be fitted in a certain manner or it will fail in its results. Conditions peculiar to the work in hand and perhaps not met with in another locality are known; the supervising officers know all that and have communicated their knowledge to their men—what if the men fail them? All the previous effort count for nought, the failure becomes a time-waster, and the cost of such failure should be measured. Then inaccuracy occurs in other directions: wrong numbers quoted, materials wrongly described, quantities and weights all astray; all this has to be rectified, with the resultant time-wasting. I will later on put a few pertinent questions concerning time, but my remarks here are sufficient to direct the thoughts of construction and maintenance men to where improvement may be shown.

The works order will then probably go to the switchroom or test department, where again supervision, good work and accuracy are demanded very similar in results but different in application. The works order will tell, for instance, what service a subscriber is entitled to, if a wrong code is fitted or wrong number quoted, only to mention everyday inaccuracies, we get more time-wasting to rectify.

The works order will then be made up and completed by the local offices and returned to the district office. Now, what if we find at the district office that everything is not clear, things not as plain as they might be, an error in a date here, an illegible figure there, and so on? It means that the works order has to be returned to the local office for amendment, or a question raised which will draw a straight answer to put the works order in order. Here again is more time-wasting.

Now as regards works orders, you may take it that if these are in order little fault can be found with our work. The works order is the hub of the Company's administrative system from which all else radiates. Let us see that we show improvement in our dealings with it.

To sum up my remarks: they have dwelt in the main on new business and accuracy. As regards new business we will cultivate improvement in our actions, acquiring courteous and prompt methods, and show our enthusiasm in the idea of all becoming emissaries of this telephone service. And as regards accuracy, we will improve with and, under supervision, show improvement in our work by bringing it from good to better, and as for accuracy, we will attain improvement here by particularly noting and taking to heart all our errors and inaccuracies, and thereby eliminate all time-wasting. I promised that we would put a few questions to ourselves concerning time. Here they are, and possibly we can show some improvement. Are we time-wasters, spendthrifts of mornings, squanderers of afternoons? Are we willing to put up with interruption—sufferers, ready to stop work at any time to talk trivial or irrelevant matters? Do we waste other men's time by interrupting their work; do we talk personal affairs in business hours; are we day dreamers, office loungers, chair warmers, good-natured idlers, or dead in earnest workers? Do we keep any account of time; do we charge ourselves up every day with so many hours spent, and credit ourselves with so much done in each one of those hours; do we need a couple of days to think a matter over before we move; do we use an hour to do a thing that ought to be done in five minutes; do we waste a day on a matter that deserves only an hour's attention? We must not feel hurt by these questions; if we are guilty of any of these delinquencies we are harming ourselves more than anyone else. If the cap doesn't fit, we needn't put it on. If it does fit we shall be doing ourselves a favour by putting it on, and he who can hold it on another who needs to wear it will be that other's best friend. These are searching questions I know, but when we think seriously such questions are necessary. Some of you may be thinking, "Oh! here's a man living in a glasshouse throwing stones." Well, I readily admit my own weaknesses, but I was never more conscious of them then when writing this paper. There is place for improvement in us all, and any of you who are pedestal sitters, and are not conscious of your weaknesses I recommend you to sit down and spend a few hours in writing a paper on a similar subject, and I am sure your weaknesses and their remedies will immediately become apparent to you. If in my remarks I have set your minds turning towards "Improvement" I shall be satisfied.

LONDON AND ITS ORGANISATION.

BY J. STIRLING, *Metropolitan Chief Accountant*, AND H. DAVIS, *Metropolitan Stores and Workshops Manager.*

THE METROPOLITAN WORKSHOP.

THE author of that oft-quoted phrase, "the poetry of motion," had, of course, something more graceful and less inanimate than mere machinery in his mind when he wrote. Yet in every workshop, small or large, there is to be found something of the poetic—the poetry of whirring belts and grinding drills; of hard metal and dull wood turned into graceful polished articles of usefulness. There is also that more human poetry of labour, which the lines of Walt Whitman have exalted.

To most men there is an undoubted attractiveness about a workshop or factory. Some cynics might say that it is due to the pleasure derived from seeing other people work. It will probably be better not to attempt an analysis of the reasons, but rather to accept the fact. It is certainly a pleasant experience to loiter at the benches, to watch the skilled workmen as with nimble yet careful and unfaltering hands they shape and trim and polish, until the finished article lies before them; to see the pride with which they contemplate a specially good piece of work; to note the personal regard which many of them have for their machines, their tools, their own place at the bench, those many little things which are not of much account individually, but which mean so much to a man's comfort and pleasure in his work.

These reflections have been induced by an afternoon's wandering in the Metropolitan workshops at Dalston, where large numbers of the battered telephone wrecks of London are each year docked for repairs, to be afterwards sent on another voyage as fresh and trim and serviceable as when they first left the maker's hands.

The Company's Dalston premises (Fig. 1) in which the workshops are situated, comprises exchange, engineers, contract and stores offices, besides extensive accommodation for general stores, cable, poles, trucks, etc. The workshop occupies the ground floor and portion of the first floor. On the former are situated the

foreman's office, working benches and instrument stores; the latter is devoted to the assembling, fitting and testing of instruments.

Figs. 2 and 3 show sections of the general establishment, the instrument stores being behind the glass partition at the rear, an arrangement which greatly facilitates the booking in and out of material. One special feature in the foreground of the former

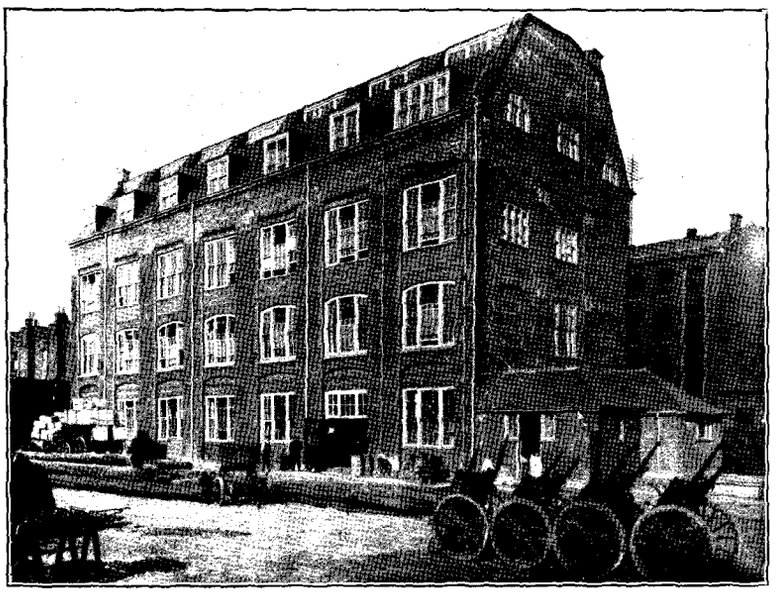


FIG. 1.—DALSTON PREMISES.

photograph is the "Dey" time recording clock. It is used for marking the hour at which the men come on duty. Each man is allotted a number, and by simply turning the handle of the apparatus to that number on the rim of the main dial, the time as shown by the clock is stamped opposite his number on a specially ruled sheet of paper inside. The sheet is changed at the end of

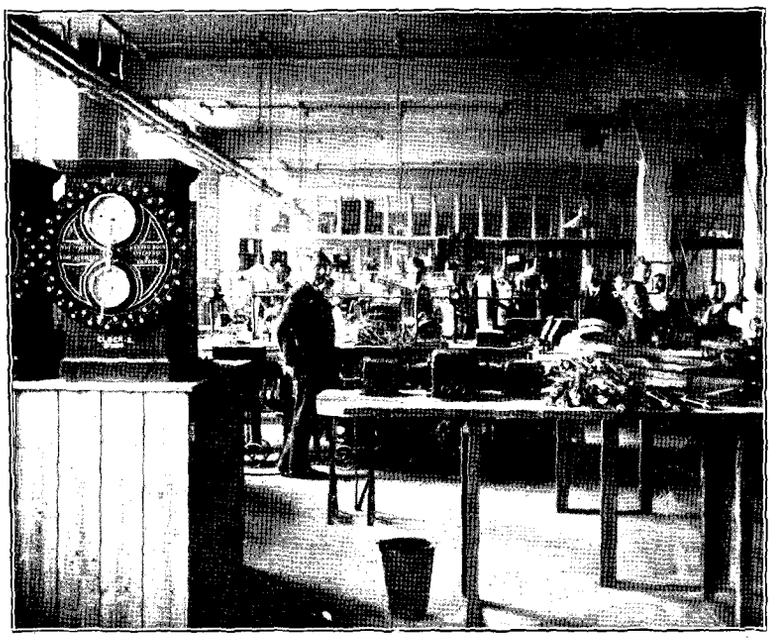


FIG. 2.—SECTION OF WORKSHOP (GROUND FLOOR).

each week, when the names of the men and their wages are entered by the workshop's clerk in provided columns, opposite the respective numbers; the section on which these entries are made is then detached, and sent into the Chief Accountant's Office. As the men know the positions of their numbers on the dial, the marking-on is done very expeditiously.

Broadly, the work carried out may be divided into—(*a*) ordinary maintenance, which includes such jobs as rewinding armatures, odd repairs to central battery pedestal sets, repairing and rewinding indicators and relays and refitting switchboard cords; (*b*) renovation of recovered apparatus, such as instruments, switchboards and electrophone installations.

Briefly, the various renovation processes for an ordinary instrument are: (1) Carpenters dismantle cases and make good defects; (2) cases are sent to wirers for all old wires to be taken out and new put in; (3) polishers polish all woodwork and japan metal work; (4) carpenters put wood and metal parts together; (5) instrument is sent to fitting benches for the fixing of generator, and assembling and refitting of parts, previously taken out for replating and overhauling. Instruments when completed are handed over to the Workshops Test Department to be passed for use; if the test is satisfactory, they are placed in custody of the storekeeper for issue to the Fitting Department as required.

The whole of the labour on recovered instruments is paid on a piecework system. A number of instruments, probably 25, are given out to a group of workmen (say, four). They undertake the complete renovation at a price per instrument fixed by the workshop foreman. On completion, the total amount for the job is allocated

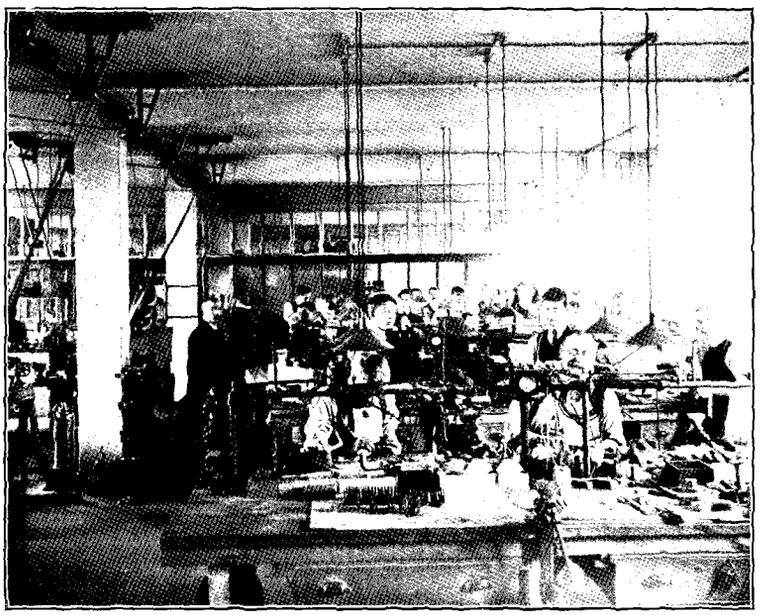


FIG. 3.—SECTION OF WORKSHOP (GROUND FLOOR).

amongst the workmen in proportion to the rate of wages which each would be paid when engaged on time work. The arrangement is found to work well, and tends to a maximum of industry, without being in any way prejudicial to efficient results, as the penalty of scamping is making good without pay.

The method adopted for keeping in touch with the cost of the work is the issue by the Chief Accountant of a works order to renovate a group of instruments—usually 50 or 100. When that particular works order is on the eve of completion, another is issued, so that there are never more than two of such works orders in the hands of the workshop authorities at once, and only one of these is being worked on. Simplicity in the booking of wages and material is thus secured, and errors in charging are non-existent. Only stores used in repairing or replacing parts and fittings are debited, the instruments themselves being recorded by the storekeeper in a special book when delivered to and signed for by the workshop foreman: the entry is cancelled when the instruments are returned ready for use. Each works order is returned, on completion, to the Chief Accountant's Office, where the cost slip is attached, and anything abnormal brought under the notice of the workshop manager. At the end of the month a return of all the jobs completed, showing the actual expenditure, proportion of rent, machinery depreciation, etc., and the market value of the instruments repaired, is forwarded to Head Office.

Recovered switchboards are dealt with in precisely the same manner, excepting that each works order is for a smaller number, and not more than one size of board is covered by any one works order. For cost comparisons this is essential.

Switchboard plugs are always with us for repairs. Large quantities of these are treated for some sort of ailment every month. The system in force in London is that the exchange inspectors, on finding faulty plugs, book out new ones to replace them, the old one being recovered at half-value. When a moderate supply of the latter has accumulated at any store they are sent in to the Central Stores at Dalston, from whence they are handed out to the workshop to be restored to working order, the usual works order, as in the case of instruments, being issued by the Chief Accountant. Again, only one works order is allowed to be worked on at once, a policy which has been amply justified by smoothness of working and freedom from mistakes.

One principle worked to throughout is that the workshops should not hold any stock. The principle is stated for the purpose of mentioning an exception—the usual fate of principles in these hustling times. We have recently been entrusted with the conversion to direct magneto working of numbers of party line instruments recovered in the provinces. These are done in groups of 25, four sets of 25 being operated on at once. Each group is dealt with by four mechanics. The accounting process is to book the instruments out as party line wall sets on the works order for their reconstruction; on their return to the storekeeper he credits them to the same works order as magneto wall sets. The iconoclasts eagerly seized upon the pretext for breaking down the non-stock idol, but agreed that it should be done "without prejudice." Fifty per week is the present turn-out of these conversions, that number being sufficient to meet the requirements of requisitions sent to us by Head Office from various parts of the country.

With the development of private branch exchanges has come an influx of work on apparatus required for subscribers' premises. Some special jobs of this kind are always in hand. As instances,

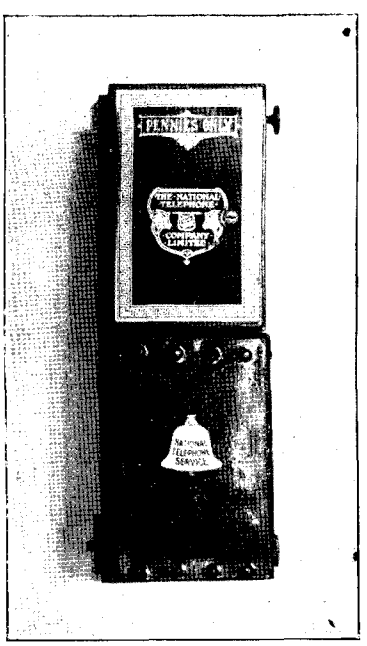


FIG. 4.—NEW PATTERN MONEY BOX WITH SAFE LOCK.

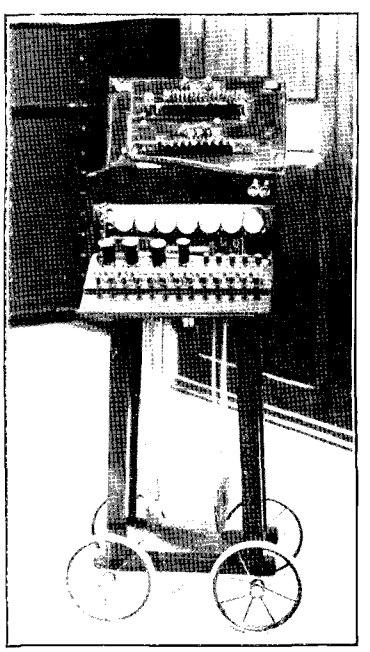


FIG. 6.—NO. 6 ROUTINE TEST SET.

special test frames have recently been made for large installations at the Army and Navy Stores, Harrod's and Selfridge's; the test frames for all the principal hotels were also constructed at the workshop. Small switchboards have frequently to be made up for premises where the standard pattern cannot be used, or is in some way unsuitable; this particularly applies to offices in the neighbourhood of the Stock Exchange, where there is a premium on office accommodation, and the telephone apparatus has, in consequence, to be adapted to the exigencies of space.

The workshop claims credit for devising the separate call office money box (Fig. 4) which has recently been adopted by the Engineer-in-Chief for use throughout the country. As a matter of fact, the box was the result of an evolutionary process, various devices having been tried in London to circumvent the wiles and

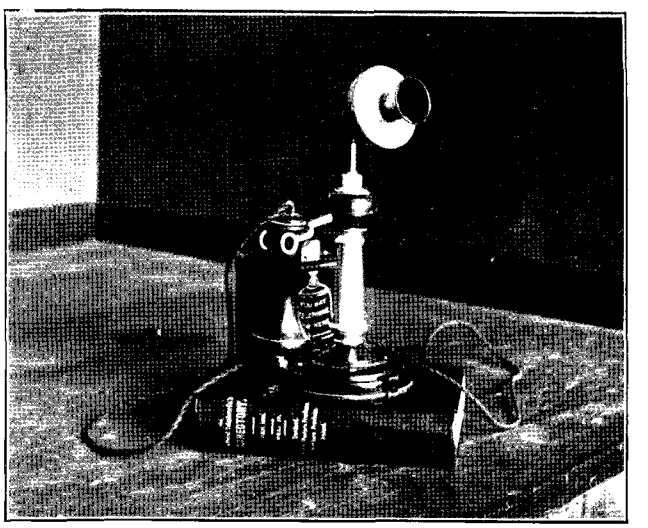


FIG. 5.—STORES COUNTER BOX.

subtleties of the automatic-box thief. The subject was discussed repeatedly at the weekly meeting of Metropolitan chief officers until the present box with its flat lock became the final type. All the experiments, however, were carried out at the workshop, and great credit is due to those officers who did the work. Certainly the adoption of these boxes has meant a very large saving to the Company, and some time before Head Office made them Stock List articles we had commenced substituting them for the old type at all the call offices in London.

Another pattern of box—designed at the workshop—is the one in use at large stores to enable a counter pay service to be at the disposal of customers. The box (Fig. 5) is 4 inches by 4 inches by 3 inches, outside measurement, and is just sufficiently large to hold the coppers for one day's calls at a busy counter. The mechanical arrangements and internal fittings are exactly the same as in the ordinary standard automatic box. Special Yale locks are supplied with a master key, which is in the possession of the subscriber, so that he can have the boxes cleared. The private branch exchange operator is responsible for hearing the pennies put in by the caller. Between 400 and 500 have been fitted in London, and are serving their purpose admirably.

The Engineer-in-Chief from time to time invokes the aid of the workshop staff in the making of experimental apparatus. One example was the "inductometer," described by Mr. G. M. Shepherd in the JOURNAL for April, 1909.

The first routine test sets were also made up here to Head Office instructions, and we are now supplying experimental types of these to central battery exchanges throughout the country, numerous improvements having been introduced by the Engineer-in-Chief since the construction of the first pattern. Fig. 6 shows a No. 6 test set.

Several artificial cables, varying from five to 50 miles, have been provided for Head Office testing requirements, besides a number of odds and ends of apparatus which one cannot catalogue. Special work of this kind means, of course, valuable experience to the mechanics, and they in turn like to put their best into it.

Amongst the work now in hand is the extension of cables, register rack, and test frame to accommodate 700 additional lines at Kensington central battery exchange; also an extension of the test frame for Westminster Exchange.

(To be concluded.

OVERHEAD CONSTRUCTION IN BELGIUM.

BY E. R. G. SHEPHERD, *Local Engineer, Birkenhead.*

PERHAPS readers of the JOURNAL may care to see a few photographs showing some types of overhead line construction which I came across during a short holiday trip to Belgium. I did not attempt to make any definite study of the methods of construction adopted by the Belgian State Telephone Department, but could not resist the temptation to take notice of some points in which their methods differ from ours. In general terms I may say that the principle that underlies these methods seems to be that the standards or poles may be self-supporting and independent as far as possible

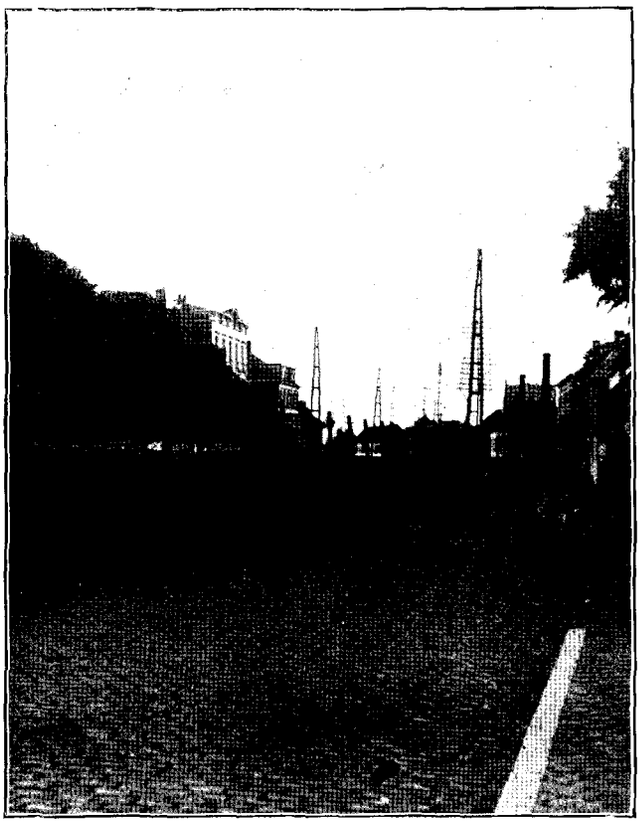


FIG. 1.—ROUTE OF GROUND WOOD POLES AT BRUGES.

of wire stays. For roof standards, and, in large towns, for ground poles, the use of angle iron seems universal, and the structures are designed so as to be very rigid and at the same time very light and (I trust the photograph will bear me out in this) not unsightly. In the small towns and in the country the same principle is carried out in light creosoted wooden poles. These poles are too light as a rule to stand singly, and are doubled or made up into "A" or "H" poles and braced together with short cross or diagonal trusses to secure the necessary stability. In many cases I noticed wood ground poles made up of two light poles in "A" shape with a third pole braced between them at the apex to obtain sufficient height, and one of such standards may be seen in Fig. 1.

The distributors for underground work are quite handsome. They consist of a square iron or steel lattice-work pole about 55 or 60 feet high with section sufficient to allow of an iron ladder being permanently placed in the inside of the cross-section for workmen to gain access to the wires. The base is cased in with solid cast-iron plates—with a door leading to the ladder—the base at the pavement level being 6 feet square in several I measured. I may mention in most cases I noticed that the side path was specially widened to accommodate these distributors. At the tops is a sort of "crow's nest" of rings of angle iron in which the men can work, a network of iron wire being at the bottom of the crow's nest, no doubt to prevent things falling into the street below. See Fig. 2.

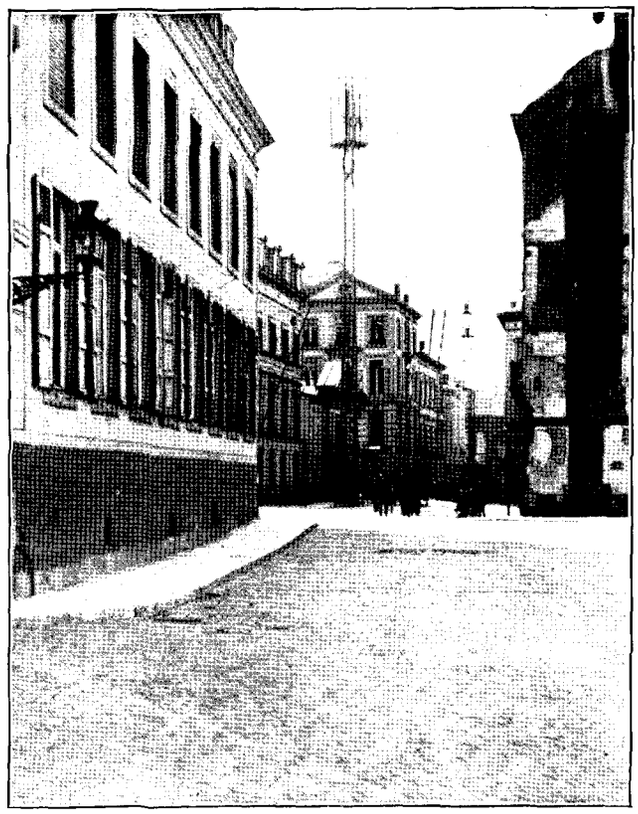


FIG. 2. LATTICE-WORK DISTRIBUTOR AT BRUSSELS.

Fig. 3 shows the exchange derrick at Bruges; Fig. 4, a typical iron ground pole in Antwerp.

Fig. 5 shows a roof standard at Antwerp. I may mention that the lattice standards are ornamented with light iron scroll-work, which, however, does not come out clearly in the photographs.

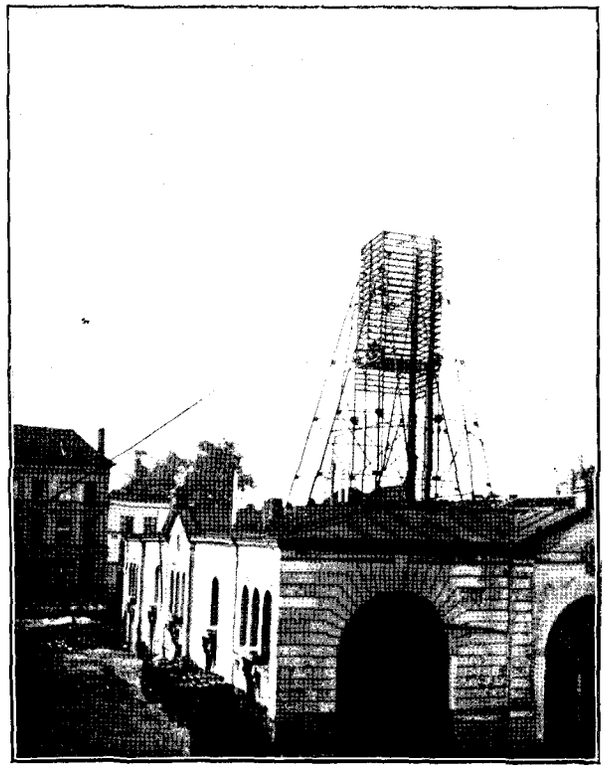


FIG. 3.—EXCHANGE DERRICK, BRUGES.

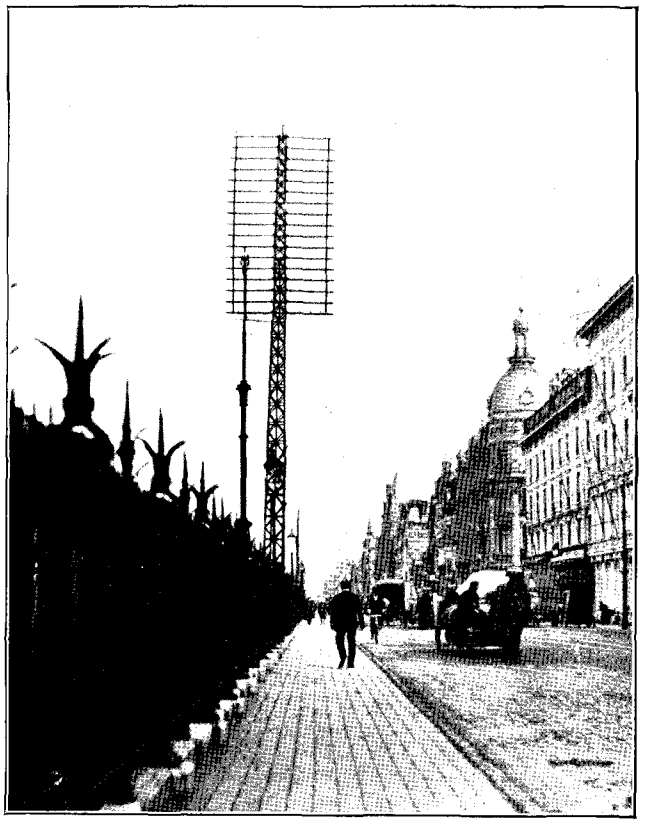


Fig. 4.—Lattice-work Ground Pole at Antwerp.

I noticed very heavy and long spans of open wire across the trolley wires, and in order to run new wires over the guard wires as many as three large portable ladders on wheels are used with long wooden crossbars across the top for the wires to pass over.

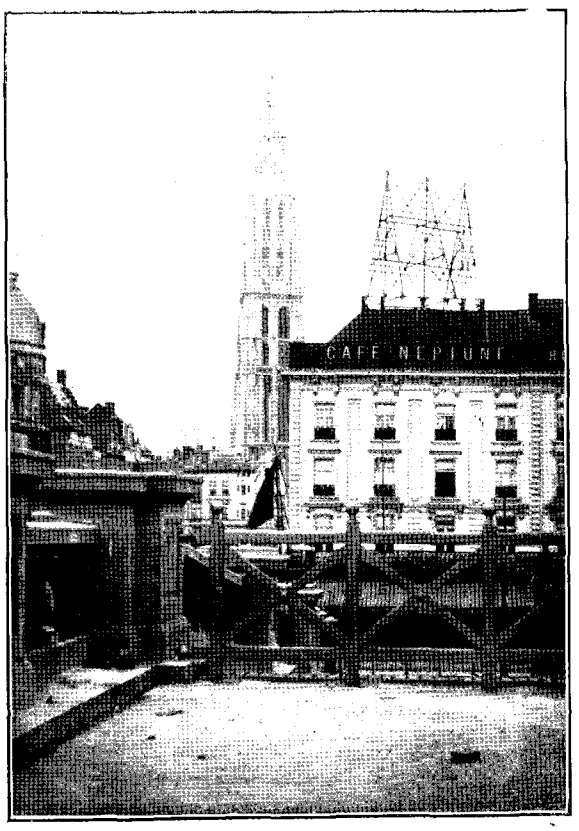


Fig. 5.—Roof Standard at Antwerp.

THE TELEPHONE STATIONS OF THE WORLD.

By W. H. Gunston.

(*Continued from page* 116.)

America.

When we come to ascertain the statistical position of the telephone in America we are faced with difficulties which do not arise in respect of the old world. There are scarcely any Government systems in either the North or South American continents; on the other hand there are companies innumerable ranging in size from the Bell, which operates from the Atlantic to the Pacific, down to the rural telephone company supplying a single small community. It is easy enough, thanks to the courtesy of officials, to obtain up-to-date statistics from the large companies both in North and South America; but to arrive at an accurate total for the whole continent as at Jan. 1, 1909, is quite a different matter. The development of the telephone in America is so enormous, the annual increase is so rapid, and, it may be added, so variable, that it is difficult to estimate within some thousands the growth of a large aggregation of independent systems, two to three million subscribers strong, in the course of a year. Moreover, the International Bureau at Berne publish no figures relating to America (as they do in respect of Europe and Asia) which would serve to show the progress of the telephone year by year. With these prefatory remarks we may proceed to consider the telephone stations of

North America.

Canada.—The Bell Telephone Company of Canada, operating in the provinces of Ontario and Quebec, had on Jan. 1 last, 106,994 telephones. In addition, they gave service to rural companies with 15,000 additional stations. At that date they also owned about 1,500 telephones in Saskatchewan, which have since been sold in the Provincial Government. There are independent companies in Montreal with about 500 subscribers, Peterboro' (Ontario) with about 200, Ingersoll (Ontario) with about 500, and Sherbrooke (Quebec) with about the same number.

In Manitoba, the telephone service is in the hands of the Government, who operate about 20,000 stations. The province of Alberta also has a small Government system.

In Nova Scotia the Nova Scotia and allied companies have about 10,000 telephones working. Private companies also exist in Prince Edward Isle, New Brunswick, and British Columbia. Making due allowance for these systems there are thus about 160,000 telephones now working in Canada. The principal towns are—

Toronto	24,182
Montreal	24,021
Winnipeg	12,000

United States.—The official census of telephones, as at the beginning of 1908, showed a figure of 6,118,578 stations, of which 3,132,063 belonged to the Bell Companies; 835,880 were independent telephones connected with the Bell system, and 2,150,635 belonged to purely independent companies. The number of stations of the Bell Companies (in connection with the American Telephone and Telegraph Co.) as at Jan. 1, 1909, was 3,215,245, or including all stations served by the Bell system, 4,364,629. The above-mentioned total of 6,118,578 stations shows an increase of 158 per cent. on the total for 1902 (2,371,044 stations), or about 750,000 a year. At this rate of increase the total number of telephones in the United States at the beginning of 1909, could not be less than 6,870,000. The rapid development of the telephone in America is well illustrated by the following figures of the Bell system:—

Jan. 1, 1895	243,432
„ 1900	632,945
„ 1905	1,799,633
„ 1909	3,215,245

The measured rates were introduced in 1894, and in five years the number of stations had increased 160 per cent.

In the three years from 1900 to 1903 they nearly doubled, and between the latter year and 1907 they more than doubled.

The following table gives the number of stations in the principal cities :—

Bell Companies.

	Number of stations.
New York	326,907
Chicago, Ill.	169,134
Boston, Mass.	109,300
Philadelphia, Pa.	98,345
San Francisco, Cal.	48,533
St. Louis, Mo....	41,836
Cincinnati, O.	41,180
Pittsburg, Pa.	38,805
Baltimore, Md....	37,498
Detroit, Mich.	37,232
Washington, D. C.	33,251
Los Angeles, Cal.	32,816
Cleveland, O.	29,964
Milwaukee, Wis.	27,891
Denver, Colo.	26,012
Seattle, Wash....	24,198
Kansas City, Mo.	23,006
Buffalo, N.Y.	22,125
Portland, Ore.	22,098
Omaha, Neb.	19,289
Providence, R. I.	18,721
Minneapolis, Minn.	17,491
Oakland, Cal.	16,639
Newark, N. J	15,752
New Orleans, La.	15,473
Indianapolis, Ind.	14,527
Spokane, Wash.	14,521
Dallas, Texas	13,020
St. Paul, Minn.	12,567
Atalanta, Ga.	12,253
Jersey City, N. J.	12,133
Columbus, O.	11,850
Louisville, Ky.	11,681
Worcester, Mass.	11,150
Syracuse, N. Y.	10,521
New Haven, Conn.	10,483
Richmond, Va....	10,152
Hartford, Conn.	10,052

The towns in which the independent companies have more than 10,000 stations are as follows :—

St. Louis	32,000
Philadelphia	30,000
Kansas City	23,000
Cleveland	22,000
Buffalo...	18,000
Toledo (Ohio)	13,000
Indianapolis	12,500
Columbus (Ohio)	12,000
Grand Rapids (Michigan)	10,100
Minneapolis and St. Paul (together)...	24,000

Mexico.—The Mexican Telegraph and Telephone Company had in 1906 5,626 stations in Mexico and other cities. In 1908 this number had increased to 5,975, so that it may be assumed that the total at the beginning of this year did not greatly exceed 6,000. The Ericsson Company have started a system in Mexico City which already has over 800 subscribers, and an independent company in Puebla has some 350 stations. The total number of telephones in Mexico is probably about 8,000.

Small telephone systems exist in *Honduras*, *Guatemala*, and *Costa Rica*. The establishment of a system in *Panama* is about to be commenced.

Jamaica.—There is at Kingston a telephone company possessing about 300 subscribers, and there are small exchanges with 30 to 40 subscribers in various other towns in the island. These with the systems of the United Fruit Company and the Government railways bring the total number of telephones up to about 550.

As regards *Cuba*, I hope to be able to give particulars of the number of telephones next month.

Summary of North America.

	1909.
Canada	160,000*
United States (6,118,578 in 1908) ...	6,870,000†
Mexico	8,000†
Jamaica	550†
Total, with allowance for Cuba and Central America	7,040,000

SOUTH AMERICA.

Brazil.—The telephone service in this State is in the hands of a number of private companies, American, German, Swedish, Norwegian and French. The Rio de Janeiro Tramway, Light and Power Company operates the service in Rio, and has 3,670 stations connected. According to an American consular report there are altogether 9,200 telephones in Brazil, 1,997 being in Sao Paolo, 1,479 in Pelotas, 631 in Pernambuco and 554 in Bahia.

Argentine Republic—The United River Plate Company, an English concern, is by far the principal telephone administration here. It possesses about 24,000 stations, of which about 17,500 are in Buenos Aires. The Co-Operativa Company has also some 5,000 subscribers in Buenos Aires, and local companias exist in many of the smaller towns. The total number of telephones in the Argentine is therefore about 30,000.

Uruguay.—The principal telephone system is that of the Monte Video Telephone Company, who have 3,778 subscribers in that city. A local company has about 2,000 subscribers so that the total number of telephones in Monte Video cannot be less than 6,000.

Chili.—The Chili Telephone Company possessed 7,846 subscribers in Chili on Jan. 1 last, of which 3,368 were in Santiago, and 2,001 in Valparaiso.

In *Venezuela*, *Peru* and *Ecuador* British telephone companies operate, but I have been unable to obtain particulars of the number of stations existing.

British Guiana.—According to the latest information to hand, 509 stations existed here.

Summary of South America.

Brazil	9,200
Argentine Republic	30,000†
Uruguay...	6,000†
Chili	7,846
British Guiana	609
Total, with allowance for Peru, Ecuador, Venezuela and Paraguay	57,000

* Partly estimated. See above. † Estimated.

(To be continued.)

MUNICIPAL SCHOOL OF TECHNOLOGY, MANCHESTER.

WE have received the well got-up calendar of this institution for 1909-10. It is a fully illustrated volume of upwards of 500 pages giving particulars of lecture and practical courses for almost every conceivable branch of science and art. Telephony is fully covered, and there is a special advanced course for students employed by the Company, for which the lecturer is Mr. G. S. Wallace, of the Manchester staff.

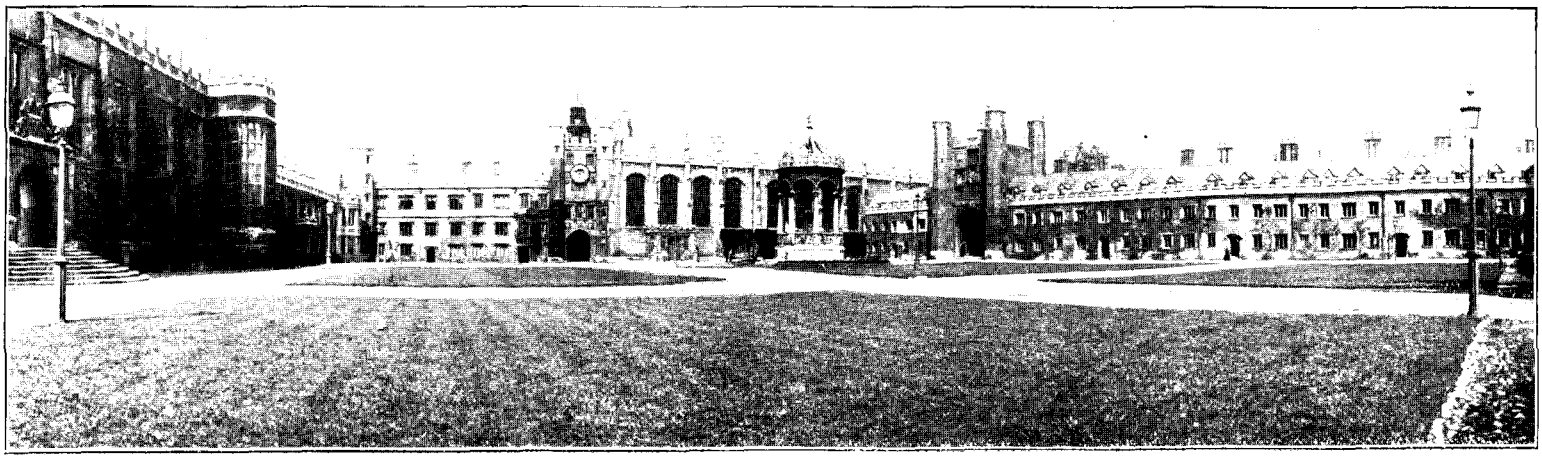
CITY AND GUILDS INSTITUTE.

THE following members of the Engineer-in-Chief's staff have been successful in the examinations in telephony held by the City and Guilds Institute :—

J. W. Wheeler	First-class honours and silver medal.
E. Williams	Second-class ,,
H. C. May..	First-class ordinary.
W. L. Merrick	Second-class ,,
J. R. Hembrough..	,, ,, ,,
W. Hicks	,, ,, ,,
R. S. Rowe	,, ,, ,,

And the following have passed the examinations instituted by the Board of Education :—

F. M. Bowers ..	First-class magnetism and electricity.
,, ..	Second-class practical mathematics.
J. W. Portway ..	First-class model drawing.



TRINITY COLLEGE, CAMBRIDGE.

TRINITY COLLEGE, CAMBRIDGE.

PRIVATE BRANCH EXCHANGE.

BY J. STUART BEST, *Acting Local Manager*, AND HENRY J. HERINK, *Chief Inspector, Cambridge.*

WE suppose there is scarcely a reader of the JOURNAL in any part of the world who has not heard of Trinity College, Cambridge, though it may be doubted if any of them ever thought of it in conjunction with a modern telephone installation, such as has been completed within the past few weeks.

This college, while not the oldest in England, is probably one of the most interesting, tracing its history from the year 1316, when King Edward the Second "supported certain scholars, under the government of a warden or master," and in 1337 Edward the Third, pursuing the plan of his father, founded King's Hall, part of whose original gateway and buildings are now embodied in the main gate and quadrangle of Trinity College. The complete buildings enclosing this quadrangle—which is said to be the most spacious in Europe, having an area of 90,180 square feet—are made up of several other establishments which have in the intervening years been linked together by different Royal patrons and masters. King Henry the Eighth, whose statue adorns the main gate front, consolidated the whole into one magnificent college by letters patent, dated 1546, dedicating it "To the Glory of Almighty God, the Holy and undivided Trinity." His son, Edward the Sixth, gave a Code of Statutes and further endowments, as did also his daughter, Queen Mary. The towers of the gate were eventually completed in the reign of James the First, and are built of red brick, faced with sandstone. At the side of the gate are chambers which were occupied by Sir Isaac Newton, who was one of a brilliant succession of scholars, and by men of science including Macaulay, Bacon, Thackeray, Byron, and others. Several statues in the ante-chapel also commemorate other famous names. The chapel itself was finished by Queen Mary in 1564, and its particular interest to a telephone engineer lies in the carved stonework of its roof, owing to the great care which had to be taken when running lead cables over it (see Fig. 2). This brings us to the present day and to the heading of our article.

The college has been served for a good many years by an exchange line to the porter's lodge, but on the completion of the new central battery exchange and the placing of the main routes underground in Cambridge, which has been done during the past eighteen months, the service was so much improved that the Company were enabled to secure an order for an up-to-date central battery private branch exchange.

The switchboard, equipped for five exchange lines and twenty extensions (a wall pattern, owing to space being limited), is fitted in the porter's lodge under the tower of the main gate, which thus becomes the central point of telephonic, as well as historic, interest.

Owing to the size of the courts and the necessity to make provision for probable alterations and extensions, and the fact that no open wires could be run over any part of the buildings, considerable difficulty in planning was experienced.

With the exception of the two exchange lines, two power circuits and one ringing circuit run from the nearest cable distribution point, there are no open wires on the college, and these terminate on the gate tower on a special iron attachment, which had to be made somewhat in keeping with the character of the building.

The distribution difficulty was overcome by the use of lead-covered dry-core cable, run on the roofs, and as far as possible under lead flashings and copings to be out of sight, and not in the way of temptation for irresponsible students.

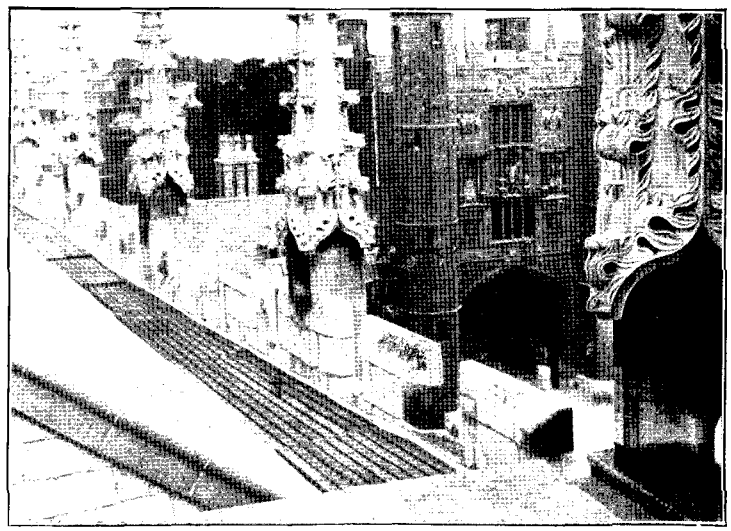


FIG. 1.—CHAPEL ROOF AND GREAT GATE.

The main cable from the lightning arrester rack to the top of the tower is a 50-pair, branching inside the parapet into 25, fifteen and five-pair distributing cables, with a five-pair spare tail (Fig. 1), the fifteen-pair being terminated in a pot-head on the iron attachment, spares being thus available if required for future junctions, or extensions to the detached portion of the college, or Whewell's Court at the opposite side of Trinity Street.

The five-pair is carried round one side of the quadrangle and over the chapel roof, distributing at King Edward's Gate Clock Tower. The clock here is of great age, and peculiar for its double-time chime, the hours being struck twice on two separate and differently toned bells. The 25-pair runs round the two other

sides, over Queen's Gate, terminating on the roof of the kitchens, where it is split into two ten-pairs and a five-pair tail, the wires in this latter being teed out at intermediate points *en route*, and are capped up as shown in Fig. 3, for future needs. From this joint also the kitchen extension is brought out. This it need scarcely be said, is by no means the least important circuit, although the department has a direct exchange line. Seeing it has to supply 600

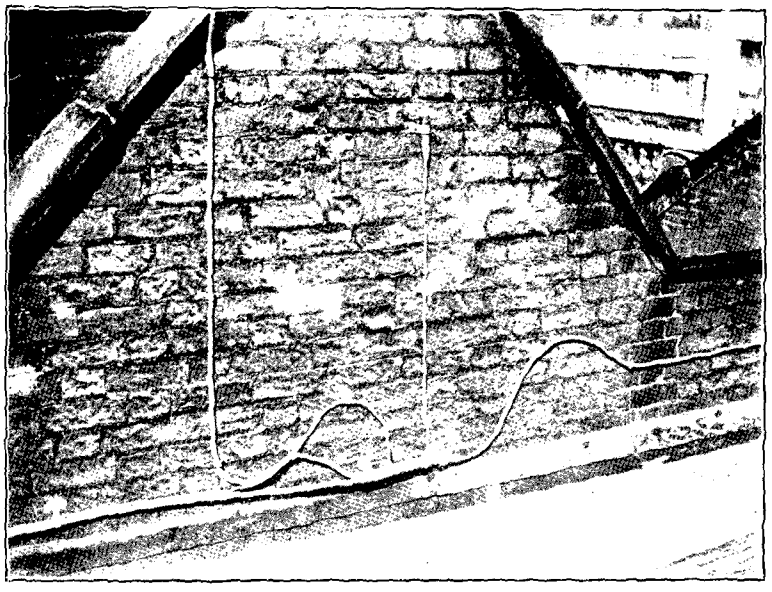


FIG. 2.—END OF 25-PAIR CABLE.

dinners daily for a good portion of the year it needs considerable telephone facilities.

At the back of the great quadrangle, and lying between it and one of the prettiest reaches of the River Cam, are two other courts, King's and Neville's. Of the latter, one side is bounded by the dining hall, the other two by the library, and chambers over the cloisters, built by Sir Christopher Wren in 1695, at a cost exceeding £20,000.

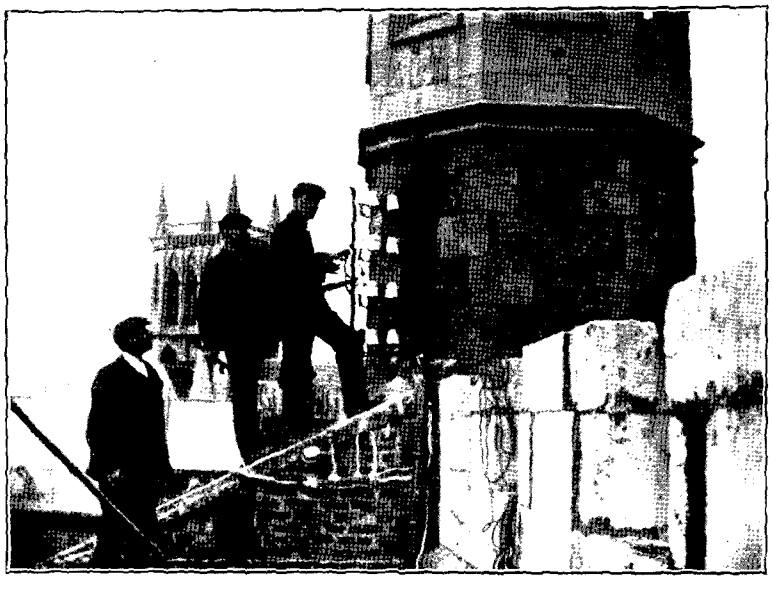


FIG. 3.

Lord Byron "kept" (to use a 'varsity term) in this court. The rooms are now principally occupied by Fellows of the college, and the greatest care had to be taken to run the cable and paint it so to match its surroundings as to be practically invisible.

This (Neville's) and King's Court are fed by the two ten-pairs, and in all a total of 1,271 yards of cable were run with a wire mileage of about fifteen and a half miles.

The conjunction of lead-covered cable with fourteenth and fifteenth century brick and stonework seems somewhat incongruous, but hardly so much so as a central battery pedestal instrument on some of the old carved oak shelves in the rooms.

It would perhaps be difficult to find finer specimens of both stone and wood carving than there are here, and considerable ingenuity was needed to arrange even the small inside pot-heads, so that they should not clash.

The fitting and wiring presented many difficulties. In some cases walls 2 feet thick had to be drilled through, as it was impossible to carry the wires round. All the fitting, however, both of the switchboard and instruments, was completed in 120 man-hours. This, considering the conditions under which the work had to be done, probably constitutes a record.

The photographs were procured by the kind permission of J. W. Capstick, Esq., M.A., Junior Bursar, who is himself a keen scientist and engineer. The rare privilege was given to the

FIG. 4.—RUNNING 25-PAIR CABLE.

Company's staff to take their cameras to any place they liked in the college, so that a very interesting collection of prints has been secured, though many of scarcely sufficiently technical nature for reproduction in the JOURNAL.

Some amusing anecdotes might be told of incidents in connection with the work, the "bedmakers" being very curious as to what it all meant. One old soul when she first heard the bells ring, dropped her brushes in fright, declaring "she would'nt have a 'typhoom' for anything." Many also of the college officials and Fellows even had never used a telephone before, and special instructions were issued by the college office for using the service.

This installation, though the most perfect, is not the only switchboard in the group of colleges forming the University of Cambridge. Caius College had a switchboard and extensions fitted as far back as 1885, of which the head porter was and is very proud, as although of a pattern long since obsolete it was an object of curiosity and wonder to others beside the college servants. St. John's and Emmanuel Colleges followed later with small systems, and most of the others have direct exchange lines with perhaps one or more extensions. Negotiations are in progress for

a small private branch exchange at the present time with one of the few colleges not yet connected.

It is hoped in the near future the good example of Trinity may be followed by other institutions and business firms. Within the past year several of the larger firms in Cambridge have taken up the private branch system with highly satisfactory results.

TELEPHONE WOMEN.

XLIX.—ETHEL WINIFRED TAYLOR.

MISS TAYLOR entered the Company's service as temporary operator at Oldham Exchange in October, 1895, and was placed on the permanent staff on May 22, 1896.

At that time the Company's Oldham Exchange was in Priory Chambers, Union Street, where a 300-line earth-circuit non-multiple switchboard was installed for local traffic, the trunk traffic being dealt with by two ten-line sections. The Company removed to their present exchange and offices in Ascroft Street January, 1896, where a 600-line magneto call-and-clear switchboard was fitted, together with a section for trunk traffic. Ten trunk lines were terminated here—namely, six to Manchester, two to Liverpool, one to Rochdale, and one to Ashton. On the transfer to the Post Office of the trunks in April, 1896, twelve junctions to the Oldham Post Office were fitted in lieu of the above-mentioned trunks. The trunk service is a very important feature in Oldham, and there are now no fewer than 52 trunk lines terminated in the town, for which the Company provide 70 trunk junctions, whilst there are now 1,320 subscribers connected in the area.

ETHEL WINIFRED TAYLOR.

Miss Taylor was appointed to fill the position of Clerk-in-Charge (which includes the supervision of Oldham, Shaw, Middleton, and Saddleworth Exchanges) in August, 1906. She has performed the duties with conspicuous ability, and is popular with and highly respected by the staff under her control. Miss Taylor confesses to a liking for walking and social functions, and in every case where the latter have been held in connection with the Oldham centre their success has been largely due to the whole-hearted manner in which Miss Taylor has entered into and organised them.

L.—MOLLY VANSTONE.

MOLLY VANSTONE, Clerk-in-Charge, Torquay, was born at Plymouth, and may well be described as an excellent example of the type for which Devonshire is so justly famous. She had not lived very many years in that export town before her people removed to Torquay, and there it was that Miss Vanstone first became actively identified with the Company's interests, entering the service at the

MOLLY VANSTONE.

beginning of 1898. Only four years elapsed before she became Clerk-in-Charge of the Torquay Exchange, a position in which she has remained up to the present time. During her experience with the Company she has witnessed many changes, including the removal of the switchroom to the situation it at present occupies, and the transfer of the whole Torquay centre from Plymouth to Exeter district upon the formation of the latter in 1903.

Miss Vanstone's popularity with subscribers is only equalled by the esteem in which she is held by the staff. As is only to be expected from the natural facilities afforded by the town in which she lives, Miss Vanstone's chief recreations are boating and walking. She also takes a keen interest in photography.

TO AN OPERATOR.

SWEET maid, whose skilful fingers weave
With plug and jack the magic circle round
O'er which from brain to brain the flash
Of thought, or deep or shallow, wends
Its frequent way.

Who standest at the meeting of the ways
Like to the keeper of a toll-gate old
Or like a modern officer of law,
Wielding a fair white hand to regulate
The busy traffic.

Be merciful as you are fair and when
Again I ring "Exchange," in small requital
Of this my song,
Don't keep me waiting long.—E. M. BUCKLAND.

TESTING SWITCH.

IT is regretted that by an error on page 126, column 1, 16·5 ω is given as the resistance of coil Q instead of 15·5 ω.

The National Telephone Journal.

"BY THE STAFF FOR THE STAFF."

Published Monthly at
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VOL. IV.] OCTOBER, 1909. [No. 43.

THE PERSONAL TOUCH.

THERE still exists a class of hotel of the old English type where, when the traveller arrives, the host himself comes forward to welcome him, himself conducts him to his room, takes the order for his dinner, and makes it his personal care that his guest's wishes are carried out and his comfort assured. The impression made on the stranger by these personal attentions is one of confidence, the expectation of considerate treatment is engendered, and he insensibly begins to feel at home, whilst in some of the larger and more palatial establishments the greeting of the guest is perforce left to some clerk, he is allotted the number of his room and conducted thither by a page boy, feeling that he is but a small unit amongst other units and that the personal attention he can command will be entirely proportional to the amount of his tips.

In all this there is a direct application to the telephone service. Although the National Telephone Company's is a large modern system, dealing with a service whose essentials are rapidity and business-like brevity, and although the units of which its *clientèle* consists are numbered by hundreds of thousands, it desires, nevertheless, that there should be a warm, personal touch in the relationship between its officials and the public. It is believed that further progress can be made in the direction of obtaining the subscriber's complete confidence. A good suggestion is made, in this connection, by Mrs. DISTIN in our Correspondence column, to the effect that when the instrument is first fitted and the line joined up to the exchange, the new subscriber should be placed in communication with the clerk-in-charge, welcomed, as it were, into the fold and made to understand that here is someone who is always available in case of trouble, and whose personal care it it will be to see that the subscriber's service is efficient and satisfactory. No system is ever so large as to render it impossible to give personal attention to its patrons if its employees are imbued with the right spirit; and there is no doubt that the feeling may be (and often is) inculcated in subscribers that the operator attending to his section of the board is *his* operator on whom he may rely with confidence to do the very best for him in all cases, and the sound of whose voice on the line is an assurance of courteous and prompt attention to his wants. The exigencies of exchange working and the arrangement of staff hours do not, of course, admit of the handling of one section of the switchboard by the same operator, nor are the rush and pressure of the busy hour favourable to ample courtesies and marked individual attention. But much may be done in this direction; and if the subscriber is made to feel that he has a friend, or at least one who takes a personal interest in his service, at the other end of the line, a great deal will have been achieved towards the smooth working of the service.

THE "DOOMED" OPERATORS.

THREATENED folk notoriously live long; and we do not apprehend that the above disquieting heading will deprive any of the Company's operators their sleep o' nights. Again, our old friend the automatic exchange makes one of his customary appearances in the daily Press with the usual expatiation on the girl-less *régime* which is coming and the blessings it is supposed to bring in its train, and lastly, the usual notes of doom foretelling the early days when telephone operators shall cry "Othello's occupation 's gone!"

We are naturally enough getting habituated to this prophesy. The automatic telephone is acquiring a respectable age—or, at least, mature youth—and in America quite a number of moderate-sized exchanges working on automatic principles exist. Quite a number in a comparative sense, of course; for in America subscribers on the manual system are reckoned in millions, and those on the new principle in thousands. Even in Europe small experimental exchanges were at work in Vienna several years ago, and were followed by others in Innsbrück and other Austrian towns. What, then, is the cause of the present prophetic outburst? An American consul discovers an automatic exchange at Hildesheim, which, as a matter of fact, has been extant for some time, and refers to it in his consular report. Straightway, with that unanimity begotten of the modern news-distributing agency, the marvellous tale appears broadcast in both London and provincial papers, together with those clairvoyant glimpses of futurity which we have already remarked.

The automatic system no doubt has its advantages in exchanges up to a certain size. But the heavy initial expense, the cost of maintenance and the complications associated with its application to large systems, together with the fundamental difficulty that the automatic transfers the operating from the expert operators to the inexpert public, cause most telephone engineers to prefer switchboards worked by a well-trained staff. The automatic is little likely to replace the manual system generally, and so the operator will go on being "doomed" periodically until she has left the service, married and possibly brought up daughters, who, if they become telephonists, will no doubt be doomed in their turn when some newspaper discovers that there is an automatic system in full swing at Timbuctoo or Tehuantepec.

CULTURE.

The plea put forward by Mr. MILNES in our Correspondence column for the establishment of some society for dealing with subjects of general interest and moment outside the technical side of telephony, and more particularly with literary and artistic questions, merits earnest attention. That attribute vaguely known as culture, and often very imperfectly understood, is an inestimable boon to all who move in civilised communities, and a source of ever fresh enjoyment to the mind which has imbibed it. The well-trained scientific mind cannot but benefit by acquiring a sympathetic understanding of matters of deep significance which are outside his field of knowledge, for the relationship of all arts and all sciences is closer than is often imagined. The attempt to create an antagonism between the scientific and artistic mind is an antiquated form of folly. A man cannot specialise to any great extent in subjects outside his life-work, but between intelligent comprehension and specialisation there are many useful and, it may be added, delightful degrees of knowledge which are well worthy achievement.

HIC ET UBIQUE.

A DOCTOR writing in *St. Bartholomew's Hospital Journal* on "Points in the Etiquette of General Practice," says:

(3) A telephone is, of course, a necessity. Let me suggest that you cut it off at night after retiring to bed, unless you have a confinement imminent or a very serious case. It is so very easy for nervous people to ring you up unnecessarily, and you will find that urgent cases will always manage to send if you are really wanted.

The correspondent who sends us the paragraph remarks that so far as he has been able to trace, only two London doctors have taken the proferred advice and cut off their telephones at night, but on representations being made to them they have ceased the practice. He suggests that the author of the article is probably better acquainted with the etiquette of his profession than with that of the telephone.

We must confess that there is something in the suggestion made in the last lines of the paragraph which, in a way, is quite amazing. Of course if a man requires anything very urgently he can possibly obtain it, even if all the aids of science be withdrawn, and all the labours of inventors discarded. A man might wish for instance to visit his dying mother at Brighton, but if, finding the train service capriciously cut off, could "always manage" to walk there or hire a conveyance. Of course, his mother might die before he arrived, but that would not invalidate the good doctor's argument. He could reply, triumphantly, "The man was no worse off than those who lived before the days of railways." The application of this instance is obvious.

THE *Globe* has the following remarks on "The Stage Telephone":—

Some time ago we commented on the use of the telephone on the stage, but the subject is too vast to be briefly dismissed within the compass of one note. It cannot be that actors and acresses have no knowledge whatever of the telephone outside the theatre, but this would seem to be the case judging from the way in which they handled it on the stage. In the first place, the machine is usually put on a table in the centre of the room, where it is horribly in the way of everything else. But worst of all, the actor seldom thinks of ringing up the central office. He lounges gracefully to the table, takes up the mouthpiece casually, and says, "Hullo Jones. Is that you?" And curiously enough it always is Jones, who appears to spend his life hanging on to the other end of the wire. Or if the actor does remember that there is such a thing as the exchange, he does not trouble to ring it up; he merely raises the telephone to his lips and says "Put me on to 92 X," and there he is at once. Another strange thing is that he seldom has any difficulty in making himself heard, although he seldom masks his beautiful lips with the mouthpiece. And, lastly, he rarely, if ever, rings off. We trust that the new secretary will see to it that special courses of instruction in the proper handling of the telephone are given to all aspiring young actors and actresses at the establishment which was founded by Sir Herbert Tree.

We will only add in extenuation of the actor that if the telephone instrument is of the common battery pattern there is no need to ring off. The telephone is simply replaced on the hook.

THE TRANSMISSION OF LORD ROSEBERY'S SPEECH FROM GLASGOW TO LONDON BY ELECTROPHONE, SEPT. 10, 1909.

By G. F. GREENHAM, *Chief Electrician, London.*

AT 5.30 p.m. on Wednesday, Sept. 8, the Electrophone Manager, Mr. A. E. Abbott, was advised that negotiations were in progress regarding the transmission of Lord Rosebery's much-advertised speech by electrophone to the *Evening News* office at Carmelite House in London. Mr. Abbott was requested to be prepared, if necessary, to go at once to Glasgow. At about 6.30 p.m. the same evening I arrived home and was informed that something was evidently wrong, as several calls had come through to me from people who wanted to speak to me urgently and that the Electrophone Manager was at that moment waiting on the line. I was soon in possession of the little information that was available regarding the project and telephoned to my Superintendent for definite instructions. It was arranged that Mr. Abbott should collect some necessary apparatus together and then prepare himself for a night journey north. At 11 p.m. I received confirmation of the scheme and instructed Mr. Abbott to proceed with his assistant, Mr. Pattman, to Glasgow by the midnight train, taking with him such material as would be unobtainable in that city. The information that it was possible to obtain regarding the scheme at this hour was very limited, and Mr. Abbott's instruction was scarcely more definite than that he was to go to Glasgow and transmit Lord Rosebery's speech to London. The rest was left to the imagination and the common sense of the Electrophone Manager. An hour or two was snatched for sleep in the train and the rest of the journey was taken up by the two "expert electricians," as they have been designated by the newspapers, in plotting out a plan of action. The train arrived punctually at 9.15 a.m., and a dash was immediately made for the district manager's office. Mr. Valentine, who until this moment knew nothing of the arrangement, immediately recognised that urgent steps must be taken if success were to be achieved and set the necessary machinery in motion. Introductions were rapidly made, firstly to Mr. Brown, the contract manager, and secondly to Mr. Allan, the district electrician. Mr. Brown, who seemed to know and be known by everyone of importance in the town, sought out Sir John Ure Primrose at his club and introduced the travellers. Sir John was kindness personified and gladly gave his consent to the transmission of the speech to London. Then followed an interview with Mr. A. S. Macharg, acting on behalf of Mr. John Ker, the organising secretary. This gentleman gave a letter of introduction to Mr. Freer, the General Manager of the Corporation Halls, as it was impossible to instal the apparatus without his permission. This gentleman, being until this moment entirely unacquainted with the project, offered some natural opposition to such an innovation, but on learning that the scheme had received the sanction of Lord Rosebery himself he went out of his way to facilitate the work being carried to a successful issue. Mr. Allan's aid was now sought and a staff of fitters and carpenters were soon in evidence. Material was obtained as if by magic, and the work commenced. The only space that could be obtained as an operating room was a very small enclosure under the stage, but as any port is welcome in a storm so this confined space proved a veritable palace in this instance. Enquiries elicited that Lord Rosebery, when speaking, was to stand at a small desk in the centre of the stage, and as it was inadvisable to mount the transmitters directly on the desk for fear that they should have arguments forced into them with a heavy hand, it was decided to erect a little stand in front of the desk and the carpenters were quickly at work in preparing this. The stand consisted of a rectangular framework with a little recess at the top to carry the transmitters. The side facing the audience was neatly draped with some red material, and in order that the transmitters themselves should not distract the speaker a neat little silk curtain was fitted over them. The transmitters were placed in this stand, which was of such a height as to cause them to stand about four feet from the ground and just clear of the desk. Further transmitters were fitted along the front edge of the stage and these were screened from the vulgar eye by an 8-inch

board which was specially fitted on the edge of the stage for the purpose. The necessary switches and apparatus for controlling the circuits were fitted on two 2-feet 6-inch square back boards in the recess under the stage, and the wiring was so well done by the local staff that it might have been a permanent installation that had been erected instead of one which was to be dismantled a few hours later. The fact that no faults were found on a test through being made, speaks well for the skill of the men engaged on the work. While the apparatus in the hall was being put together three circuits were being run to the Royal Exchange in order to bridge the gap between the Trunk Exchange and the hall. This in itself was no mean feat, as it was necessary to run three circuits a distance of a mile. The whole work was completed and tested out satisfactorily at the Glasgow end by twelve midnight on Sept. 9.

Messrs. Abbott and Pattman during the speech were ensconced in the little room under the stage. Anybody not in the know might have mistaken them for Fenians who had placed themselves there with the intention of blowing up the stage with the object of reducing the number of ground landlords.

Mr. Abbott, in describing his experience to me on his return to London, was very loud in his praise of the extreme courtesy and enthusiasm displayed by all in Glasgow who had had a hand in the preparation, from the District Manager downwards.

Whilst the preparations were in progress in Glasgow we were not idle in London. Early in London of Sept. 9 I obtained some more definite information regarding the scheme and made my plans accordingly. We were to have the use of two trunk lines between Glasgow and London and these were to be extended at the London end to the *Evening News* office, Carmelite House, where twelve reporters were to be stationed. The necessary material for the equipment of the office was soon collected together, and with the help of one or two members of the electrical staff the arrangements were completed and tested out satisfactorily by 9 p.m. At the *Evening News* office two rooms were set aside for the occasion, one for the reporters and the adjacent room for our private use and as an operating room. On the centre of the long table in the reporters' room was fixed a baize-covered board, and to this were fitted the four-point jacks to serve as connections for the electrophone receivers. In the adjacent room to which the connections were run was fitted the switchboard and other apparatus used as a means of completing and supervising the connections. At 12 30 p.m. by the courtesy of the Post Office a test through was made, when it was found that one of the trunk lines was very noisy. This was found to be due to a contact with a private wire in the cable through which the London trunk junction ran. This was quickly remedied, and both circuits were then in excellent condition. At one o'clock the connections were through from end to end, and we in London could distinctly hear people trooping into the hall. The organ recital was if anything too loud to be pleasing, and as an indication of the good transmitting qualities of the lines, I placed a receiver connected to one line to a transmitter connected to the other, and Mr. Abbott heard the music after it had been transmitted to London and back, a distance of 800 miles, without any appreciable cutting down. The speaking began at two o'clock, and lasted until 3.45 p.m. and the reception during the whole time was excellent. Only a few words were missed by the reporters when Lord Rosebery dropped his voice very considerably. At the *Evening News* office everything possible was done by the editor to make the event a success, but as the steps taken have been already described in the daily papers, I will not dwell on them here. It was an anxious time before and during the meeting, and it was a great relief when all was successfully accomplished. Five minutes after Lord Rosebery sat down I had a copy of the *Evening News* handed to me with the greater portion of the speech printed in it. Within another five minutes these were being sold in the streets.

The success of the scheme was due entirely to the willing co-operation of all those who had a hand in the preparations, but undoubtedly the brunt of the work was born by the Electrophone Manager. Thanks are also due to Mr. Dobson of the Trunk Exchange, who made the arrangements in regard to getting the connections through at the Post Office exchanges, and to Mr. Wright, the maintenance electrician in London, who supervised the equipment at Carmelite House.

CESSATIONS.

By W. F. TAYLOR, *Contract Manager London.*

IT will be recollected that our esteemed President in his remarks at the General Meeting of the Company, held in London on Feb. 25 last, referred at length to the very large number of subscribers who had abandoned the telephone service as the result of bad trade or other circumstances. At the same time he gave some striking figures which I should like to repeat.

In the year 1906 there were 21,181 cessations.
" " 1907 " 25,115 "
" " 1908 " 28,281 "

It will be seen that the number of cessations very largely increased each year. A certain proportion of the increase is of course due to the natural expansion of our business. Taking the figures as a whole, however, they are certainly startling enough, and I fear that during the last six months a decidedly upward tendency will have been noticeable.

Bad trade, such as we in this country have been suffering from for eighteen months or two years, does not affect everyone alike, and while it may "knock out" a few weaklings at the beginning, many are able to stand up against it for quite a long time; further, as our rentals are collected in advance this gives a subscriber a year's grace, so that it is now that we are feeling the worst effects of the decline in trade.

I have no doubt that the cessation question has given food for very serious thought throughout the country, and it may be of interest if some particulars of how the cessations are made up here are given.

Each month I take the London cessations and have them analysed to find out the reasons given by subscribers for leaving the service, and the results are not only interesting, but almost consoling, as they prove that the high cessations are not the result of any slackness on the part of the Company, either in the contract or any other department, but of circumstances over which it has not the slightest control.

Four headings—namely, "Solicitors' cases," "Left premises," "In liquidation," and "No further use, paid to cancel"—now account for roughly 76 per cent. of the total cessations in the following proportion:—

Solicitors' cases,	32	per cent.
Left premises	32	"
In liquidation	4	"
Paid to cancel	8	"

leaving only 24 per cent. for all the other hundred and one reasons which are given by subscribers for giving up the service.

During one month this year solicitors' cases reached the enormous total of 42·5 per cent. The combined percentages of solicitors' cases, and "left premises," since January may be interesting when compared with the same month of 1908, as showing the trend of things.

	1908	1909.
January	34·5	47·3
February	52·1	61
March	41·5	45·8
April...	37	50·1
May	44·4	66·2
June	54	64·4

The monthly average of the two works out in 1908 44 per cent., 1909 55 per cent., an increase this year of 11 per cent., or if we take May and June only the averages are 1908 49·2 per cent., and 1909 65·3 per cent., an increase this year of 16 per cent., which I think speaks for itself.

It will be appreciated that the cases mentioned above are hopeless from the beginning, and the ceasement section of the Contract Department has not the faintest chance of retaining the subscribers.

We know that in America the proportion of cessations to new business is generally higher than it is here. For instance, in Chicago during a period of sixteen months, the telephone company got 59,044 "in" orders and 31,183 telephones were "ordered out," as they put it, which is about 52 per cent.

I am aware of cases where the figure has gone as high as 62 per cent., but there were exceptional circumstances. Of course their net gain is very much greater than ours, owing to the vast new business figures which we in this country can only look upon with envy, and perhaps just a touch of hope that the British public will ere long wake up to the possibilities of the telephone service.

I have always maintained that a proportion of 33⅓ per cent. of cessations to new business is quite high enough in this country, even in the large towns, and it should certainly never be exceeded in normal times, and if the number of contract officers is in proportion to the size and importance of the district it may even be very materially reduced.

However much we may try at the present time to keep down cessations, I think it will be agreed that the circumstances are too much for us. We can only wait with what little patience we possess until trade brightens up a little, when the number of cessations from the four reasons given will be automatically reduced.

We can do something, however, in three other directions to improve materially the position. Firstly, tackle the non-hopeless cessations in a businesslike and energetic way, keeping in view the important fact that it is better to retain a subscriber than to obtain a new one. This, I think, will be clear to everyone for obvious reasons.

Secondly, keep the new business up so that the net gain does not suffer. This I know is difficult, for the same reason which makes subscribers give up the service prevents others from coming on. It can be done, however, and although it may cost a little more, surely it is worth working and paying for.

Thirdly, we can greatly minimise the loss due to subscribers leaving the service by keeping the lines thrown spare in view, and trying to get them used up quickly,—not only quickly, but as close to the old subscribers' premises as possible, if not in the actual premises themselves.

I would like to make a few remarks on the second point as being in my mind the crux of the position.

If ever push and energy were required, now is the time. Because trade is depressed that is no reason why we should be.

When a locomotive engine has a heavy load to pull, and a severe gradient to overcome, the stoker sees that before reaching the hill he has a good head of steam, and the driver when the hill is reached opens wide the throttle of his engine, and works it at high pressure until the difficulty is overcome.

Well now, contract officers, we have a hill to overcome. It looks like being a long and a steep one; we have to get to the top and that quickly. We must increase the pressure at which we have been working for some little time back, and we must allow nothing to stand in the way of our reaching the summit.

We want every ounce of energy we possess put into our effort and no slacking. Produce your very best arguments to overcome the excuse given for not having the service, which will be produced now more than ever, "Cannot afford it at present."

Hustle round and get more interviews in a day, and, most important of all, push home what you have to say when you do get an interview. Do not take "No" for an answer, but argue your prospective subscriber out of it. Push and pertinacity of purpose combined with an enthusiasm born of the conviction that the telephone, first, last, and all the time is the most important means of communication in existence, and that trade is only bad because among other things many people have not had the good sense to have the telephone service, will carry conviction with them, and will produce many more orders, which will more than counteract the losses we are sustaining through cessations.

I would like to add that the contract officers are not the only members of the staff who should put their shoulders to the wheel. Everyone, be he manager or office boy, engineer or fire-pot boy, traffic superintendent or operator, electrician or fitter, can do his share in pulling this mighty machine, of which we each form a part, up to the top of the steepest hill it is possible to put before us.

There was a net increase of 1,358 new stations during the month of August, making a total of 492,854. New exchanges have been opened at Reigate and Milford, near Guildford.

TRANSFER OF SURPLUS STORES.

By A. Ward, *General Superintendent's Office (Stores Department)*.

In connection with the efficient working of such a huge system as that of the Company, it is not unexpected that accumulations of material will occur from time to time. A glance at the figures issued monthly by the General Superintendent will show what a large sum of money is involved. Not only is there the question of the money lying idle, but the keeping of such surplus stocks entails a large amount of extra work by both labour and clerical staff

To reduce the accumulations with the least possible delay is without doubt the desire of all concerned. This cannot be done efficiently unless the method of keeping the record of such stock is effective. That this is not always so is certain from the errors which occur from time to time, such discrepancies being attributed to carelessness on the part of some official, whereas the system employed is more often to blame.

To obtain the most advantageous system a brief outline of the special circumstances is necessary.

(1) The stocks are varied and usually divided into the following classes:—
- (*a*) Stock List articles.
- (*b*) Non-Stock List articles.
- (*c*) Sales material.
- (*d*) Stock List tools.
- (*e*) Non-Stock List tools.

(2) They are constantly being added to and decreased.

(3) Whenever increases or decreases take place all sections concerned require to be advised.

(4) Being scattered over a wide area, the records require to be collected as shown in the outline below.

In addition the system should comply with the following essentials:—
- Simplicity.
- Minimum labour.
- Adaptability to extension.
- Applicability to each section concerned.

Often a system will work well in one department yet to carry it out in another will mean a great deal of labour and care. It will be seen from above outline that the local office is the originating point for the system employed, and whatever system is employed at the local office should correspond with that at the district office, which again should agree with the record kept at Head Office. For the records to be under a different system at any of these places will lead to confusion some time or other. Where books or lists are employed, as these are being constantly added to or decreased in a very short space of time, it becomes a matter of great difficulty and an irksome duty to show plainly what is actually for transfer. As the stocks are transferred or used it will mean the keeping open of a large number of pages for the sake of one or two items not cleared, unless these are brought forward as new entries. Further, these lists admit of errors in the constant copying from advices to lists and from lists to advices.

To avoid these repeated copyings and allow of additions and deletions, and to produce at each of the required points a uniform record of stocks for transfer, it is proposed to employ forms similar to those shown, and using these as the actual record, to use a separate form for each item, keeping the forms on the card index method with suitable indexes.

The forms are made out in duplicate at the local office—one carbon copy *A* for the local office, one carbon copy *B* for the district office, and the original for Head Office.

A is retained at the local office, *B* is signed by local manager, and, together with the original, is forwarded to district office.

On arrival at district office—

B is retained and, if the stores are over and above the district's requirements, the original is signed and forwarded to Head Office.

In the event of the stock not being in excess of the district's requirements, Form 1134 is retained and filed with 1134 *B* as soon as the stores have been redistributed.

As the stocks are used or transferred the advice of despatch is sent forward in the same manner, the form proposed being as shown in red.

A simple method of keeping the forms together would be to use a distributor Schedule No. 801, with guide cards Schedule No. 1319 indexed as required and extended as experience dictates.

STORES FOR TRANSFER.

ARTICLE Stock No

Date advised for transfer.	Quantity.	Location.	ISSUES. Date.	Quantity.	No. of advice.	If transferred, Reqn. No.

A
Form 1134. To be kept by Local Office.

Memo. to District Manager.

Local Manager.

B
Form 1134. To be kept by District Office.

Memo to General Superintendent,
Stores Department, London.

District Manager.

Form 1134.

STORES FOR TRANSFER.

ARTICLE Stock No.

ADVICE OF STORES ISSUED. No.

Quantity.	Issued from.	If transferred. Date issued.	Reqn. No.	Date of reqn.	Destination.	Leaving still to transfer.

A
Form 1124. To be kept by Local Office.

It will thus be seen that the three records have been produced with one operation with the consequent lesser risk of mistakes.

The adoption of this system throughout the service will mean a uniform record from beginning to end, minimum labour, no copying of records and thus less risk of mistakes, and a saving of trouble and worry, as only the stock actually on hand is recorded; and, in addition, complete adaptability to extension.

SOME NOTES ON THE CORRESPONDENCE CLASSES.

BY L. J. FARRIES, *Engineer-in-Chief's Department.*

IT is very possibly not realised by the students of the Correspondence Classes that in dealing with the enormous number of 2,850 members a considerable amount of organisation and care is necessary to ensure smooth working, and it is hoped that these notes on some of the methods employed may be of interest.

When these classes were started the membership was small and the work was comparatively simple, but as members increased, and the scope of the classes was extended, a definite system had to be devised.

It should be mentioned that the general direction of the classes is in the hands of a committee of three, and to aid in the work various others have been enlisted.

The preliminary work of a session starts some time before the classes actually commence operations. The syllabus has to be drafted and arrangements made with the authors of the various books for any revision required. A schedule is drawn up giving the dates on which "copy" is required, and on which the books are to be issued, answers received, issued for correction, returned corrected, and finally returned to the districts, and, as far as is possible, this is strictly adhered to.

As the names of intending members are received from the districts they are entered up on cards, and the number of books and amount of answer paper likely to be required is estimated, and printing arrangements made.

A schedule of dates for delivery of the books is handed to the printers, and to this they are required to adhere.

As the students' answers are received they are checked with the special advice notes which accompany them, and when all answers to one book are in, they are handed to the examiners.

There are in all seven examiners, each of whom is allowed eight days in which to check a batch of answers to one book. This correcting is no light task, as will be understood when it is mentioned that 700 answer papers have been received to one "M" Course book alone, and as there were ten questions in this particular book, this involved the checking of 7,600 separate answers.

There are about 12,000 answer papers received in a session, and in dealing with this huge quantity there is of course always a certain number of queries, but I find on investigation that these amount only to about $1\frac{1}{2}$ per cent. on the papers sent in, and, whilst a fair proportion of these are legitimate, it is really surprising how many students there are who expect to receive full marks for their intentions rather than their actual answers. It sometimes appears to be overlooked that the examiners are not thought readers.

When papers are returned corrected by the examiners the marks are duly recorded against the members' names on the cards, this being work which requires considerable care in view of the ultimate award of certificates.

As soon as all answers to one set of books have been examined they are returned to the districts, together with the printed official answers, a copy of which is supplied to every student, whether he has answered the questions or not.

A few figures may perhaps serve to give an idea of the amount of work involved in the conduct of these classes.

In the six courses comprised in the classes there are 54 books, containing altogether, with questions and answers, about 2,650 pages, and the correction of the proofs alone, involving as it does the checking of many pages of figures and *formulæ* is, as will be understood, no light task.

The books contain some 600 illustrations, and the blocks for these are kept in a specially constructed cabinet, while an illustrated index enables any individual block to be readily found.

The total number of questions which have to be set, and for which answers have to be provided, in a session is about 330.

Approximately 28,000 sheets of squared answer paper are sent out for the use of students, and 2,500 instruction slips.

Each time books are issued a fresh list of the number required for each district has to be prepared, this being rendered necessary by the constant transfers of staff.

Some 900 covers for books are supplied to members each session at a small charge.

A not unimportant duty which falls to be performed soon after the opening of a session is that of working out the total fees due from each district, and obtaining the corresponding credit notes.

As soon as the last answer paper has been returned corrected, and the last query replied to, there comes the final task of preparing the schedules of results.

Last session 1,820 members sent in answers to questions; for each of these the marks must be totalled, and the percentage on the maximum number obtainable worked out. The names are published of all who obtain 60 per cent. or over, and these have to be classified in order of merit in each course for every district. To these members also certificates are awarded, and last session 909 of these had to be prepared.

Other schedules are issued giving the percentage of papers sent in, and marks obtained by each province and district, in order of merit, together with sundry statistics and comparisons with previous sessions, the whole entailing a very large amount of work and requiring great care to ensure accuracy.

When the schedules and the certificates are issued, the work of a session has ended, but almost immediately the preliminary work of the next has to be started, indeed, there is practically no intermission in the work of the classes during the year.

In reviewing the work of the classes from the time of their inception one cannot but be impressed with their enormous growth. They started with some 950 members; we have since had over 3,000 who now have the choice of six courses, where previously there were but three. There have been as many as 300 members in one district in a session.

The general tendency of the work of the students has been in the way of a steady improvement. The percentage of students sending in answers has consistently increased, as has also the percentage and number of certificates awarded, and I think these improved results can be fairly traced to the consistent endeavours which have been made by those responsible to stimulate and encourage students in their work. For instances one need only to turn to the publication of results, and to the award of certificates, both of which have had an undoubtedly beneficent effect, and to the numerous circular letters which have been issued.

Students, too, have always had the right of appeal (now extend to the columns of this JOURNAL), which is, so far as I know, not allowed by any institute or examining body.

One rather gratifying proof of the careful way in which many of the students study the books is found in the fact that any printers' errors which creep in—as such things will do in the best regulated text books—are invariably pointed out, sometimes by a number of students.

We occasionally get a humorous incident in the course of a session; in particular, I remember a very inksmudged and dirty paper being received, bearing the inscription "Please excuse, due to small brother." Another student, puzzled over some point, had recourse to a quotation from the *Rubaiyat* of Omar Khayyam—giving the rather apt words from that quatrain which says:

"About it and about, but evermore
Came out by that same door as in I went"

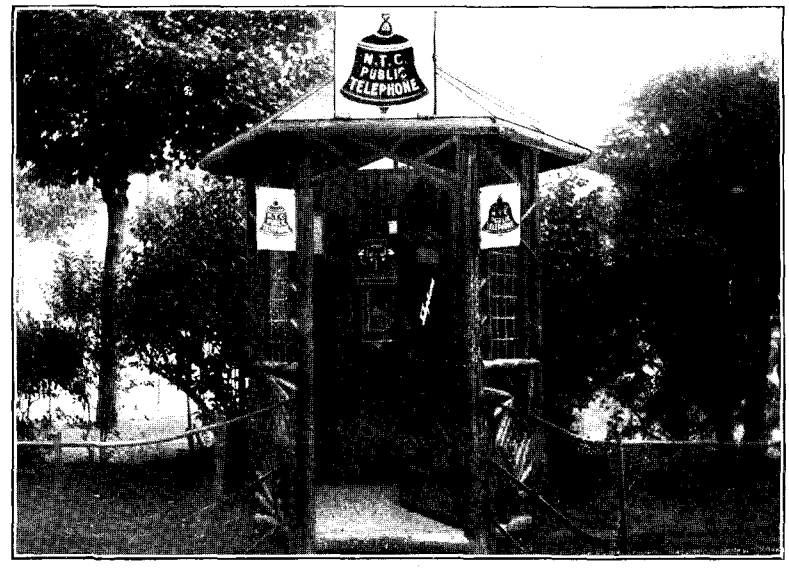
—to emphasise his point.

As in other walks of life, women are now beginning to compete seriously with the men in the Correspondence Classes. In the 1907-8 session two operators headed the "M" Course list, and in that recently concluded there were nearly 100 women members, the proportion gaining certificates being larger than was the case with their male rivals, although it is only fair to say that the great majority of the women take only the elementary courses.

I do not in these notes profess to have given a full description of the working of the Correspondence Classes, but it is hoped that sufficient has been said to give some idea of the methods employed in the conduct of this very important branch of the Company's educational system, and of its magnitude.

TELEPHONE KIOSK AT FOLKESTONE.

THE accompanying illustration shows a kiosk of the rustic arbour pattern which has been fitted at Folkestone in the residential neighbourhood, where no suitable position could be found for a "shop" call office. The kiosk has been placed in a shrubbery adjoining the pavement of Sandgate Road at the end of Trinity Crescent, a small annual rental being paid for this privilege.



The actual cost of the kiosk itself was only £11 10s., and it is well made. It is provided inside with an automatic box for the receipt of fees, local and junction calls only being allowed. It has been in use for three months, during which time no trouble has been experienced, and the revenue earned has been most satisfactory.

CORRESPONDENCE.

THE EDUCATION OF THE PUBLIC.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

ON reading Mr. Valentine's article upon "The Education of the Public," many of our experienced staff will have realised the existence of a continued obstacle to their best laid plans of discipline and system.

Remembering my own real aversion and ignorance as a subscriber in beginning to use the instrument (and being no exception in this), I wonder if a suggestion of mine would be of any help to the novice, who appears to be the particular offender and hindrance.

A large percentage of traffic trouble might be obviated if, after the telephone had been fixed, and before the inspector left, he were to ask for the clerk-in-charge, whilst the new subscriber waited, and then, when properly connected, the novice should be put in communication with her. The tone of the clerk-in-charge's conversation should be to inspire confidence combined with tactful tuition.

She should enter into common difficulties, such as unnecessarily waiting at the telephone whilst a trunk call matures, briefly explain the regulation expressions, and state that she is there for any future assistance. I venture to think this would be very much appreciated.

Information has to be given sooner or later, after much annoyance. Valuable time has been wasted, more especially if postal facilities are to be added.

Why leave such an opportunity of solving a traffic difficulty to the foreman, whose concern cannot be expected to be in that direction?

In every branch of our work much careful time is given for instruction. Why overlook the subscriber, to whom it means the greatest advantage?—and to the Company also, when we can induce people to value their telephone as much as their motor or bicycle, and not allow the community at large to tamper with its mechanism and system? What a change there will be in the operating of telephony.

F. MAUDE DISTIN, Clerk-in-Charge, Scarborough.

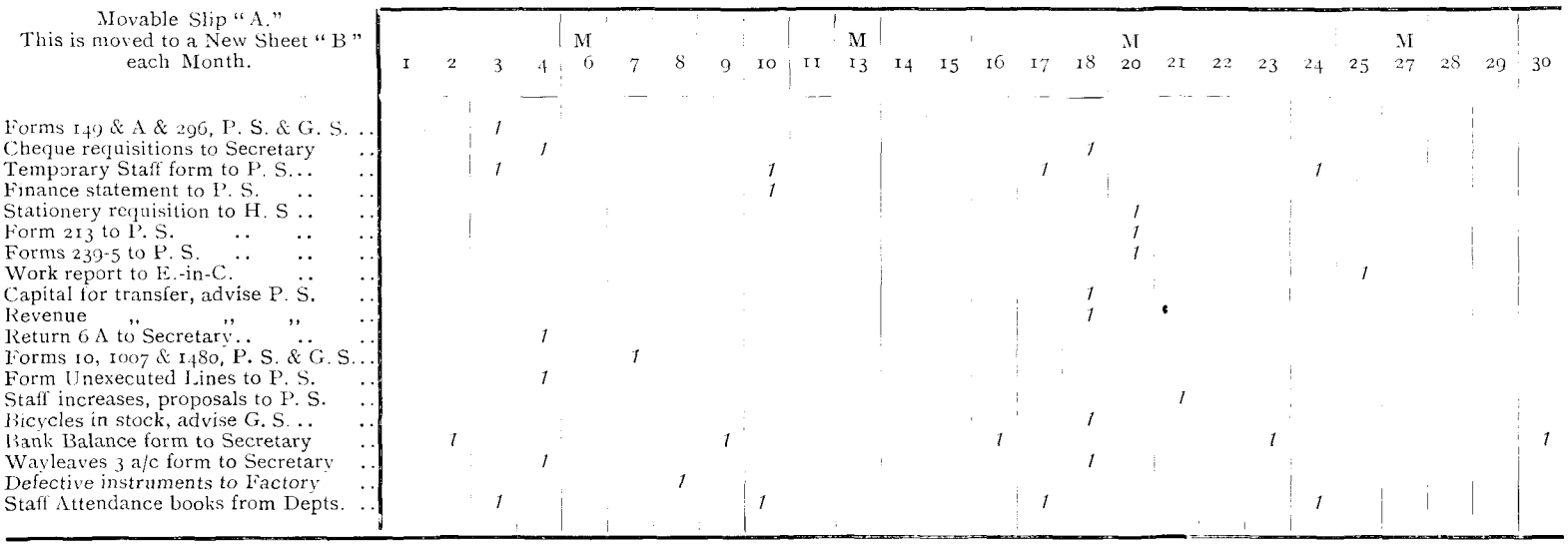
MASTER LIST FOR DESPATCHING RETURNS, ETC.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

REFERRING to the article by Mr. Dewar, Glasgow, under the above heading in the September JOURNAL. A system similar to this has been in operation in the Isle of Man district for a number of years, but I think in a simpler form. The system is as follows:—

An ordinary quarto book is divided into months for a full year, and entries made in each month of the various matters to be attended to, taking care to leave space to add other items that crop up. From this book, a return, (or chart as we call it) is made up. (I enclose short sample of one of these charts herewith). The chart is made up of two parts, part "A" is a movable slip, and part "B" the date sheet.

DATE SHEET "B."—SEPTEMBER, 1909.



It should be noted this is only part of our chart, as in some cases we have two sheets

On slip "A" is entered all the items that want attention, and as most of these come in month after month, the one slip will take all the items for one year.

Sheet "B" we make up from an old return form, which has lines already ruled thereon. We divide this up into 31 vertical columns to meet the days of the month. When this is done we pin on to it the slip "A" and make a mark opposite each item in the date column on the "B" slip, when each item has to be attended to My chief clerk looks over this each day, and ticks off the items as they are attended to, after which he hands in the chart to me for my inspection.

The movable slip "A" is moved each month to a new sheet "B," therefore doing away with the trouble of writing these items out each month on sheet "B."

I have only sent you a sample of part of our office chart, but I also use this system with all my principal men and find it acts splendidly. I came to the conclusion years ago that any principal telephone official who tried to get on without something of this sort was looking for trouble.

Douglas, Isle of Man, Sept. 13. G. GILLMORE, District Manager.

CORRESPONDENCE CLASSES.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I AM glad to see that the Engineer-in-Chief in his recent circular letter *re* the forthcoming session, has deprecated the practice of taking simultaneously classes of several grades. Why then do the Correspondence Classes Committee encourage the practice, inasmuch as they select specially for commendation members who do this sort of thing? It is waste of time to take Courses "A," "B," "C," "D," "M" and "N" in one session; if not waste of the student's time (which is largely his own concern), waste of the examiner's time, which affects all members of the classes, the papers being none too well marked. Then with regard to the usefulness of the classes. Of course they do good work now, but an engineer would consider the ratio

$$\frac{\text{work done}}{\text{work that could be done}}.$$

The result would be a very proper fraction. The aim of these classes should be to supply the Company's staff with technical telephone knowledge, not obtainable elsewhere. The books should be more technical, more practical, more complete. A large portion of their contents is made up of Service Instructions and abridgment of engineering circulars. This information should be common property and free to all concerned. Much, also, is elementary and incomplete theoretical matter, not elementary enough for those who do not know and not complete enough for those who do. The grounding of the student in the elementary principles of electricity, mechanics and mathematics could very well be left to outside sources, of which there is an abundance. The classes should get hold of the student here and show him how these things are applied in technical telephone work, so that a man, in time, would know nearly all that matters concerning his job. A former correspondent has suggested re-arranging and extending the courses to form courses in, for instance, overhead line construction, underground construction, traffic, various sections of instrument work, and so on. I think this a fine idea. A man then could take any course dealing with his work without the burden of studying a lot of stuff he does not want. It is nice to know other people's work, but it is better to know your own first. The information given would be more detailed, more connected and more serviceable. At present it leaves off just when getting interesting.

A fault of the past courses is the number of inaccuracies, not only misprints, but unscientific definitions and loose phraseology. Few things are worse for a man striving to educate himself than the knowledge (or the suspicion) that his source of information is unreliable. He will have enough troubles without that. Mr. Prentice in the July issue of this JOURNAL remarked that many standard text books contain inaccuracies, and that sometimes no *errata* slips are issued. The case is quite different. It would be a labour of considerable magnitude to trace the course of each book and issue slips to the holders. With the classes, the errors are detected in a week or so, the whereabouts of the members are known and it would be little trouble to issue *errata* slips to each. Even if it were a deal of trouble it should be done. One has to do one's duty sometimes at great inconvenience.

Another question is "could not any particular book of the series be obtained singly?" *e.g.*, in the new "D" course there will be two books on transmission with additional information, why could not these be obtained at a proportionate rate?

A last point is that the staff are to be encouraged to take up these classes. This is somewhat vague; are there any lines laid down for the said encouragement, if so, what are they?

Bristol, Sept. 15. BERTRAND C. H. RUMLEY, sub-engineer.

CODING OF EXCHANGES.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

MR. GWYTHER'S letter in the September issue of the JOURNAL raises an important and interesting point.

On looking into the matter, however, from a clerical point of view, one cannot agree with the first or sixth paragraphs of the same, that is to say that in arranging a code to represent the names of exchanges the Company's records generally require consideration. Taking as examples our rental registers, and alphabetical card registers of subscribers, the various exchanges in the district being intermixed, it is essential that a short code should be used as a part of the telephone number for individual items, and such code should certainly be uniform with that utilised for traffic purposes.

In the sixth paragraph of Mr. Gwyther's letter it is suggested that the code for the Central Exchange should be the same in all areas, and from a traffic point of view only doubtless there will be no disadvantages. As regards office work, however, the disadvantages are obvious, and apart from records previously mentioned, such an arrangement would be likely to cause confusion in Fee Department working. A code for exchanges is, I should think, essential in most districts; such code, however, should be arranged to avoid individual items clashing with other code letters, either for the Company's or Post Office exchanges in the same district.

We have had in use here for some years a fixed two-letter code (details of which are given on page 51 of the June, 1908, issue of the JOURNAL). With three exceptions, where one letter has been altered to avoid clashing with the Post Office code, this has satisfactorily stood the test of time. I may mention that in this district there are nine exchange areas, also that the code referred to is utilised for works orders and various records other than those quoted in the preceding remarks.

I venture to take this matter up with you, as it appears to me that uniformity in coding exchanges, at any rate in the same district, is essential, although the actual letters used, except that alterations cause confusion, is more or less a matter of taste.

Newcastle-on-Tyne, Sept. 4. E. T. PAYNE.

STAFF LITERARY AND ARTISTIC SOCIETIES.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

THE idea of considering the desirability of forming *societies for dealing with subjects of general interest and moment outside the technical side of telephony* has been in my mind for some time, more particularly in view of the excellent educational work done for the staff by the various telephone societies all over the country.

I hesitate to use the term "debating society" on account of its associations with subjects of triviality. What is in my mind, however, I will endeavour to make clear.

The very nature of his work necessitates the telephone man being a specialist and every day he is becoming more so. To a large extent this prevents him (or any other man in a specialised profession) from being able to take a wider interest

in life, not because he does not wish to attain to some fair degree of what I may term culture—but because he has not the opportunity, nor indeed the time, to devote to the study of the often ponderous test books which have been contributed to the world's literature.

At the same time, the value of this general knowledge cannot be over estimated. Every man is really deeply interested in his position in the world's history. He wishes to realise his position and keep in touch with the world's thought. He is living in a great civilisation, and he wants to realise what this civilisation means, what it is for, where it is leading him!

In literature for example it cannot but be seen that a lecture and debate on, say, "Contemporary Novelists" would be a great aid in directing a man to decide what was worth reading.

In art, painting would be better understood, and far more fully appreciated, could the man know the methods adopted by artists, and where to look for the special beauties of many of the pictures in our National and Municipal Galleries.

We might enumerate in the same way music and general advances in modern thought. Even the highly polemical subject of politics reviewed from an unbiassed standpoint, such as race culture, would be of great value and enable a man to realise his position and duties as a citizen of his country in a fuller and truer sense than can obtain now.

This general knowledge would I think raise the general standard of the staff, and not in any way interfere with the work.

We have chess, athletic, swimming and other clubs, why not a society which would tend to enable the staff in their leisure moments to keep in touch with culture.

I should be particularly interested and gratified to hear from any members of the staff (particularly the ladies, to whom I look for special support) and have their views on the subject.

The extremely bare outline I have given in this letter will bear much amplification. Whether the societies should be affiliated to the telephone societies or separate therefrom, and other details, are questions which could be settled once we have obtained some opinions.

Engineer-in-Chief's Department, Sept. 20. J. R. MILNES.

LONDON NOTES.

WITH reference to the closing of this correspondence, we have received the following effusion from a lady, who entitles it

THE LAST WORD.

The late disputation anent "London Notes,"
Was getting most learned and witty.
The sayings of Goethe, *Lochaber* there quotes—
A man most revered in this city.
And classic allusions no doubt by the score
Would have followed, and rare mythological lore.

We'd thought of some *very* sardonic replies,
Which Swift might have read with sad yearning;
And Shaw would have shown the most utter surprise,
At the depth of our wisdom and learning.
E'en Nietzsche, when living, fresh knowledge had gained,
If reading our Journal he had not disdained.

And although we are only permitted to guess
Whose initials they are which so hide him,
My sympathies certainly lie with "J. S."—
Because the "last word" is denied him.
But that is a woman's, and so (*entre nous*)
She's got it—as women most frequently do.—J. M.

LONDON NOTES.

THIS month we have the pleasure of recording quite a number of weddings amongst the staff. Mr. R. H. Carter, City Divisional Fitter, was presented with a walnut sideboard, the gift of his many Metropolitan friends. Mr. P. J. Ridd, Metropolitan Construction Electrician, made the presentation, and conveyed to Mr. Carter the best wishes of the subscribers for a happy married life.

The wedding of Mr. F. A. Waters, Metropolitan Cashiers' Office, to Miss Armstrong, of the Trunk Fee Department, was signalised by the presentation to the bride of a silver cake basket, and to the bridegroom of a clock and flower-stand; Miss Armstrong has been four and a half years in the service, and Mr. Waters ten years.

Mr. T. C. Law, Clerk in the Rentals Office, who entered the service as a boy over ten years ago, was the recipient of a wedding gift consisting of a handsome clock and pair of ornaments.

Other presentations were a pair of bronze ornaments to Miss Stuart of the Trunk Fee Department; and a set of fish knives and forks to Miss Smewing, Correspondence Office, Salisbury House. Both ladies have left the service to be married.

CONGRATULATIONS to Miss J. McMillan, Correspondence Department, Salisbury House, on having obtained the following honours:—First-class (senior grade) Society of Arts Examination in typewriting; senior pass, with distinction, London Chamber of Commerce Shorthand Examination; and first-class (senior) National Union of Teachers, typewriting. Miss McMillan has on previous occasions acchieved success in speed and efficiency tests for both shorthand and typing.

Mr. R. P. LOWE, Secretary of the Chess Club, has favoured us with some interesting details of the prospects for the forthcoming season, which will open on Thursday, Oct. 7. The list of vice-presidents has been augmented, there is a strong committee, and not only have a series a attractive matches been arranged in the Civil Service and Municipal Chess League, but a club handicap tournament will also be engaged in. This latter fact doubtless accounts for the furrowed brows and tragic mien of several gentlemen who have been observed intent on the tea-table chessboards which are so prominent a feature of certain cafés in the vicinity of London Wall; may success crown their efforts. "Ye Mecca," at 140, Cheapside, is the club rendezvous, and a large muster is hoped for on the opening night.

THE telephone society opens on Oct. 4. The committee are to be congratulated on having secured Mr. Hare, Assistant General Superintendent, to give the opening address. His subject—"Control"—is one upon which we expect not only some interesting observations, but a fruitful discussion. It may not be unfitting to take this opportunity of appealing to the staff throughout London for an adequate support to the society. We want three things: (1) a large membership; (2) regular attendance; (3) an interest in the meetings. There is no use disguising the fact that in none of these essentials has our record been satisfactory during the last two or three sessions. It is not creditable to London that this should be so, and apart from the loyalty which ought to ensure better results, the staff have much to gain in the shape of increase of knowledge by attendance at the meetings. Some are very faithful; it is hoped that their ranks will be largely recruited, and that we shall have attendances more commensurate with our membership and more worthy of London.

A NEW exchange was opened at Reigate on Sept. 7. This beautiful little Surrey town is well known to the jaded Londoner, who loves to flee, as each week-end comes round, from his dusty or muddy streets to the freshness and salubrity of the countryside. London is certainly well favoured in her rural surroundings, and may be not inaptly called "a black diamond in a jewelled setting." Such conditions do not always tend to profit from the business point of view, but the London merchant has discovered the worthlessness of the old bogey that a telephone in his house means business worries at home. The presence of the telephone ensures ease of mind and freedom from anxiety; this more progressive view will almost certainly spell success for our latest "residential" exchange.

ANOTHER transfer from magneto to central battery working, Walthamstow. As usual, everything passed off without a hitch, and one more has been added to the large list of London exchanges fitted with up-to-date equipment.

THERE has been a fair number of entries for the Correspondence Classes. May we be pardoned, however, for suggesting that in this respect also there is much room for improvement? London is probably no worse and no better than other parts of the country, but the value of the classes, apart from the time and trouble devoted to them by Head Office, should ensure a far larger quota of students. It is a little disappointing that so many, particularly juniors, are taking the books only; this, I fear, may mean that the books will never be read, but even if they are, the full value of the course can only be obtained if the questions are regularly answered. The proviso that any student may apply to his superior officer to have his name excluded from the published results should induce many senior officials to participate in the classes.

DOUBTLESS "social" events will soon be the order of the night. We understand that the "entertainments" committee, which did so much valuable work during last winter and the previous one, has arranged for two whist drives on behalf of the Benevolent Fund. The first of these is to take place on Oct. 13. It is perhaps desirable not to be too ambitious and embark on an extensive programme; it has been suggested, however, that one or two smoking concerts would probably be well patronised. The Bank Exchange staff are also hoping to continue their whist drive successes of last winter on behalf of charities; they will no doubt be heartily supported and as well organised as before.

MR. F. E. ROBERTS, Inspector in the Eastern Division, secured second place in the recent walk from London to Brighton. Mr. Roberts is noted for his pedestrian powers, and is to be congratulated on his latest achievement.

MR. C. S. CORKE, Eastern Maintenance Department, has just resigned, after eleven years' service, in order to take up telephone work in New Zealand. His colleagues and friends presented him with a handsome polished oak case, containing a service of plate. That Mr. Corke may have a successful career is the wish of the whole staff.

SOME interesting cable work has been carried out in connection with the reconstruction of Blackfriars Bridge. A cable and pipe subway, running between the Mansion House and Westminster Bridge, passes under the north end of Blackfriars Bridge approach. Part of the reconstruction scheme was to put down a passenger subway in conjunction with the widening of the bridge. This necessitated the lowering of the pipe subway. In consequence, various hydraulic, gas, Post Office, electric light and telephone mains were affected. Our part of the work consisted in piecing a 105 yards' length on to each of eighteen cables, varying in size from eleven pairs to 800 pairs. For the lighting of the subway while the jointing was going on, the County Council supplied electric current, and the necessary lamps were provided by the Company. As most of the circuits affected were junctions, the method adopted by the jointers was to test out each pair in the old cable with a buzzer, a condenser being in circuit at each end; as the new section of cable had been numbered before the jointing was started, it was an easy matter to connect on each circuit as it was picked up.

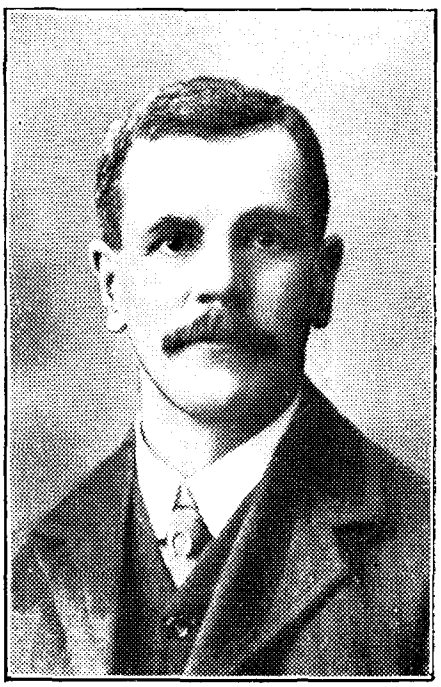
A RECENT visitor to our Gerrard Exchange was Herr Karl Glauning, Manager of the Nuremberg Telephone Exchange. J. S.

NEWS OF THE STAFF.

On the occasion of Mr. R. GILMOUR'S transfer from Belfast to the managership of the Edinburgh district, a presentation was made to him by the local directors and staff of a pair of silver candelabra.

In the unavoidable absence of the Local Directors and Provincial Superintendent, Mr. Broomhead, the Local Manager, was called upon to preside He referred to the cordial relations which existed between Mr. Gilmour and the staff, and the harmonious manner in which the work was carried out under his capable and excellent management. They all regretted very much indeed that Mr. Gilmour was leaving Belfast, but rejoiced with him in his promotion and continued preferment.

Mr. Gilmour, in his reply, said it was with feelings of surprise as well as pleasure he learned of the intention of the local directors and staff to make him



MR. R. GILMOUR.

a presentation before he should leave the district to take up his new appointment in Edinburgh. The many kindnesses of the Directors and staff towards him in the past made it still more difficult for him on the present occasion to adequately express his thanks and appreciation for that further act of kindness shown at their hands. He could assure them all that it was not without pangs of regret he left the Ulster district, where, during his thirteen and a half years, he received the greatest assistance and kindness from all. No district manager could wish to have under his charge a more loyal staff than that which comprised the Ulster district, and in taking leave of them he hoped that the future may have in store good fortune for all, not only during the remaining portion of the Company's license, but when the transfer of the system to the Post Office should take place.

MR. A. E. SUTHERLAND.

We publish a portrait of Mr. A. E. SUTHERLAND, of the Engineer-in-Chief's Department, Nottingham Factory, who had the distinction of being first in the "A," "D," and "M" Courses and second in the "B" and "C" courses.

Mr. F. H. COPELAND, Local Manager, Margate, on the occasion of his transfer to Ipswich as Local Manager, was presented by the Margate staff with a letter case inscribed with his initials.

Mr. F. SUMMARSELL (formerly of Reading), Local Manager at Ipswich, has been transferred to Cambridge in a similar capacity. The staff took the opportunity of showing their appreciation of Mr. Summarsell's official and social qualities by presenting him with a handsome aneroid barometer. The District Manager, in a very appropriate speech, made the presentation, which was suitably acknowledged. A "farewell" smoking concert was held on Sept. 11. Mr. Copeland (Margate), Mr. Summarsell's successor, owing to the District Manager's absence on holiday, occupied the chair. The "toast of the evening" was proposed by Mr. Downing (Local Manager, Colchester), and was most enthusiastically pledged. A large and very varied programme was afterwards gone through, which occupied the rest of the evening.

Mr. LYNN, Chief Clerk, Superintendent for Ireland's Office, Dublin, was on Aug. 27 presented by the staff with a gold albert on the occasion of his transfer to Cork. Mr. Cowley, who made the presentation, expressed his regret at Mr. Lynn's departure, and wished him every success in his new post. Mr. Currall, District Manager, also spoke of the friendliness existing between the staff and Mr. Lynn, whom they would all miss at their social gatherings in which he had always taken a prominent part.

Mr. R. SURPLICE, late Chief Clerk, Cork, who was transferred to the Superintendent for Ireland's Office as Chief Clerk on Aug. 30, was presented with an aneroid barometer by the staff in the South of Ireland district.

Miss CATHERINE MOORE, Operator, Leeds Central Exchange, has been promoted to Clerk, Trunk Toll Department, Newcastle-on-Tyne. She was the recipient of a manicure set from the operating staff, with their best wishes.

Miss J. GOW, Operator, Douglas Exchange, Glasgow, who left the Company's service Sept. 9, was presented with a very handsome hand-bag, silver button-hook, and shoe-horn from the Douglas Exchange staff, whose very good wishes she carries with her.

Miss TRESSA ELLIS, Supervisor at Edinburgh Central Exchange, has been promoted to be Monitor.

Miss MAUD GALLOWAY, Peg Operator at Edinburgh Central Exchange, has been promoted to be Supervisor.

Miss MARGARET MITCHELL, Senior Operator at Edinburgh Central Exchange, has been promoted to be Peg Operator.

Inspector W. BOCOCK, of Bolton, has obtained the following certificate for success in the City and Guilds (London) Institute examinations:—Full technological certificates in electrical engineering, comprising preliminary, ordinary and honours, and qualifying subjects, also honours in telephony.

Mr. T. D. HOWE, of the Head Office Buildings Department staff, who has been temporarily stationed at Cambridge, was on leaving presented with a silver-mounted pipe as a token of esteem from the Cambridge local staff.

A very pleasing presentation in the form of an engraved silver cigarette case bearing the recipient's monogram was recently made to Inspector S. H. EADY by the members of the Jersey staff as a token of their esteem and regard, upon his leaving Jersey to take up similar duties in the Brighton centre.

Miss JENNIE HOCKEY, Senior Operator, Cardiff, has been promoted to be Travelling Supervisor for the Cardiff district.

Miss ANNIE TURNER, Junior Operator, Liverpool, has resigned on account of ill-health. She was presented by her colleagues with a gold curb bangle.

Mr. E. LESLIE HAYNE, Engineering Inspector, Leicester, has been transferred to Cardiff as Assistant Engineer.

Mr. J. A. RABONE, Linesman Inspector, Leicester, has been transferred to Loughborough.

Mr. W. E. PEARSON, Engineering Inspector, Birmingham, has been transferred to Leicester in a similar capacity.

Miss ANNIE MOTTRAM, Operator, Market Harborough, has been promoted to position of Travelling Supervisor for North Wales district.

Mr. F. LUCAS, Contract Manager, Hanley, has been transferred to Leicester to fill the vacancy caused by the retirement of Mr. F. H. Tyas.

Mr. G. C. GEISLER, Draughtsman, Salisbury House, London, has been appointed temporary Assistant Engineer, Dalston.

Mr. F. E. ROBERTS, Fitting Inspector, Croydon, has been appointed Instrument Inspector, East.

Mr. L. M. GREEN, Clerk in Rentals Department, has been appointed Contract Officer, City.

Miss F. BROWN, Operator, Gerrard, has been appointed Fee Clerk in Chief Accountant's Department, Salisbury House.

London Traffic Department.—*Promotions and Transfers:*

Mr. T. A. BECK has been promoted from the position of Exchange Inspector, Gerrard, to that of Assistant Exchange Manager, East.

Miss GRACE SPARKES, Senior Supervisor, East, has been transferred to a similar position at North.

Miss ALICE KNAPP, Supervisor, Bank, has been promoted to be Senior Supervisor, East.

Miss EDITH MORGAN, Supervisor, Head Office Private Branch Exchange, has been made Supervisor at Paddington. She was presented by the Head Office staff with a brooch and gold watch, with an inscription signifying their appreciation of her services.

Miss LILIAN BEVERLEY, Supervisor, Metropolitan Operating School, has been made Supervisor at London Wall.

Miss MAUDE SADLER, Operator, Gerrard, has been promoted to be Supervisor at Hammersmith.

Miss MARGARET SMITH, Operator, Avenue, has been promoted to be Supervisor at Bank Exchange.

Miss ETHEL BISHOP, Operator, London Wall, has been promoted to be Supervisor, Avenue.

Miss ROSINA RICHARDS, Operator, Battersea, has been promoted to be Supervisor at Gerrard.

Miss ROSA MILLER, Operator, Gerrard, has been promoted to be Supervisor, Hop.

Miss LILIAN CLATWORTHY, Operator, London Wall, has been promoted to be Supervisor, Hampstead.

Miss FLORENCE MOTT, Operator, Avenue, has been promoted to be Supervisor at East Exchange.

Miss ETHEL GALLIVAN, Operator, Westminster, has been promoted to be Supervisor, Bank Exchange.

MARRIAGES.

Miss AGNES MCQUISTON, Service Operator, South Exchange, Glasgow, left the Company's service on Aug. 31 to be married. She was presented with a silver *epergne* by the staff in her exchange.

Miss HELEN CRAIG, Senior Operator, Bridgeton Exchange, who was married on Sept. 3 was presented with a silver cake basket by the exchange staff.

Miss MARGARET MCDONALD, Operator, Langside Exchange, resigned on

Sept. 9 to be married. She was presented with a case of spoons by the staff in her exchange.

Miss CHRISTINA F. ALLISON, Clerk-in-Charge, Hillhead Exchange, Glasgow, left the Company's service on Sept. 4 to be married. The staff in her exchange presented her with a silver-plated tea service.

Miss SARAH FRASER, Monitor at Edinburgh Central Exchange, resigned after thirteen years' service, to be married to Mr. T. CORNFOOT, Electrician at Birmingham. She was presented by the staff at Edinburgh, among whom she was very popular, with a silver-plated tea service, and by several of the staff with personal presents.

Miss ANNIE PARKER, Operator, Roundhay, Leeds, resigned to be married Sept. 16. She was presented with a silver flower-stand by her fellow workers.

Miss CLARA FOX, Operator, Leeds Central, was married on Sept. 20 to Mr. C. W. HALLIDAY (Chief Fitter). The Electrical Department presented them with a clock, and the operating staff with a silver cake stand. All joined in best wishes for their future happiness.

Mr. H. C. BONE, General Superintendent's Office, was presented by his colleagues with a case of cutlery and silver plate on the occasion of his marriage.

Mr. E. WAKELIN, General Superintendent's Office (railway wayleaves) was married on Sept. 25. He was also presented with a case of cutlery and silver plate.

Miss HILDA GOULD, Operator, Henley-on-Thames, resigned on July 29 to be married, after eleven years' service with the Company, and was presented with a clock by the members of the staff in the Reading centre. The presentation was made by the District Manager, Mr. J. S. Terras.

Miss JEANNIE HOGARTH, Senior Operator, Reading, resigned on Aug. 13 to be married, after eight years' service with the Company, and was presented by the local staff with an oak salad bowl. The presentation was made by the District Manager.

Miss AGNES BARKER, Operator, Wokingham, resigned on July 31 to be married, after seven years' service with the Company, and was presented with a tea service by the members of the Reading staff. The presentation was made by Mr. Terras.

Mr. J. H. DAVIE, Cost Clerk, Reading, was married on Aug. 18 to Miss J. Hogarth, late senior operator, Reading, and was presented by the members of the staff in the district with a handsome marble clock. The presentation was made by the Chief Clerk, Mr. A. Garner, in a few well-chosen remarks, to which Mr. Davie suitably responded. Several members of the staff were present at the ceremony, which took place at St. Mary's Church, Reading.

Mr. B. CLAYTON, Cost Clerk, Southampton, was the recipient of an occasional oak table on the occasion of his marriage, the presentation being made on behalf of the staff by Mr. W. Howe, the District Manager.

Mr. GEORGE HARDIE, Fees Clerk, Stirling district, was married on Sept. 22. Mr. Edmond, District Manager, in conveying to him a suitable present on behalf of the district staff expressed their good wishes for his future happiness.

Mr. F. C. FRENCH, Cost Clerk, Manchester, who was recently promoted to that position from the Metropolitan Statistical Office, was the recipient of an oak *secretaire* from the Manchester staff on the occasion of his marriage on Aug. 28.

Miss LILY TROTT, Operator Cardiff, left the Company's service on Aug. 26 and was married on Sept. 1. The Clerk-in-Charge, on behalf of the operating staff at Cardiff, presented her with a set of electro-plated table and dessert forks, also dessert spoons, as a mark of esteem and with best wishes for her future welfare.

On leaving the Company's service to be married Miss CHARLOTTE BROWNFIELD, Operator at Dover Exchange, was presented by the other members of the staff with a handsome salad bowl (Devon ware) with silver mountings and with a silver photo frame.

Mr. H. C. CLOVER, Works Order and Rental Register Clerk, Norwich, has been presented with a marble clock, suitably inscribed, as a token of esteem and good will on the part of his colleagues in connection with his approaching marriage.

Miss GRACE TYRRELL, Senior Operator at the Royal Exchange, Liverpool, resigned on July 16 to be married. She was presented by the operating staff with a dinner service.

Mr. F. H. CROASDALE, Second Inspector, Ashton-under-Lyne, was the recipient of a marble timepiece, suitably inscribed, on the occasion of his marriage. The presentation was made on behalf of the staff by Mr. J. Hart, Chief Inspector.

Mr. W. S. GRIFFITHS, Assistant Engineer, Truro, was married on Aug. 22. The Plymouth staff presented him with a cake stand and knife and the Cornwall staff with a handsome oak clock on the occasion.

London Traffic Department.—*Resigning to be Married:*

Miss ALICE ELLIOTT, on resigning from her position as Operator at East Ham, was presented with a palm-stand by the staff of the East Traffic district.

Miss GLADYS MARTIN, Operator, Croydon, who resigned in August owing to her approaching marriage, was presented by the staff there with a double set of carvers and with a silver toast rack by the Redhill operating staff.

Miss LILLIAN CLARIDGE, Operator at Sydenham, was, on leaving the service, presented with a silver mounted *epergne*.

Miss ELSIE CONQUEST, Operator, on resigning from Holborn Exchange to be married, was presented by the staff with a cake basket.

Miss FLORENCE BABB, Supervisor, Hammersmith, was presented with a tea service, rose bowl and table centre by her colleagues.

Miss ELLEN MCKENZIE, Supervisor, Bank Exchange, who resigned on Sept. 2, on account of her approaching marriage, was presented with a silver cake stand and vases, by the Bank operating and maintenance staff. Miss McKenzie, who was well known in the City district, had various other presents from members of the staff and past colleagues, comprising doylies, case of silver spoons, autograph album, silver sugar tongs, volume of poems, fruit dishes, five o'clock tea cloth and a bouquet of roses from her team. The Bank whist drive committee will be losing one of their most keen supporters, as Miss McKenzie was always to the forefront in helping and assisting at these and other social functions. We understand she will be taking up her residence in Montreal.

OBITUARY.

We very much regret to announce the death of Mrs. BRISLEY, who shared with her husband the responsible duties of Housekeeper at the Company's Head Offices since 1897, and was transferred with the staff to Telephone House in 1900. The funeral took place on Sept. 9 at Ewell, Surrey. Floral tributes were sent by the Board of Directors of the Company and the chief officials at Telephone House, also from the staff at Head Office, who were represented at the obsequies by Mr. F. E. Sims. In the discharge of her manifold, and at times somewhat difficult, duties, her capabilities and methods were exemplary and won the respect and confidence of the Directors and officers at Telephone House. For many years Mr. and Mrs. Brisley were caretakers at Knowsley, the residence of the late Lord Derby, and have also been resident housekeepers at Walmer Castle during the respective tenancies as Wardens of the Cinque Ports of the late Marquis of Dufferin and the late Marquis of Salisbury.

Mr. Brisley and family wish to thank the Directors, officials, and staff for the kind sympathy shown in their bereavement.

LOCAL TELEPHONE SOCIETIES.

Hull.—The committee of the telephone society have decided to offer six prizes for papers under the following headings:—"Commercial," "Technical," "Traffic." Each heading carries two prizes, a first of 15*s.* and a second of 5*s.*

Glasgow.—The following is the syllabus of meetings for the session 1909-10:—Oct. 13: "Mainly about New York," Mr. W. W. Cook, Assistant Engineer-in-Chief; Nov. 10: Prize night; Dec. 8, Jan. 12, Feb. 9, March 9: These nights are to be devoted to the reading of papers sent in for the premium competition on commercial, electrical, engineering, traffic and general subjects.

Birmingham.—The following is the syllabus of meetings for the session 1909-10:—Oct. 5: "Description of the Manufacture of the Company's Dry-core Cables," Mr. F. D. Latimer; Nov. 2: Discussions, "How Best to Develop the Company's Business," "Is there a Tendency to Overdo the Use of Statistics?" Dec. 7: "Private Branch Exchanges," Mr. A. Gatty; Jan. 4: "Office Routine," Mr. R. U. Tucker; Feb. 1: "The Power Plant," Mr. H. W. Dipple; March 1: "Practical Economics of Underground Construction," Mr. W. Bagley; March 15: "Exchange Management," Mr. M. J. Bowes; "Testing Out of a Central Battery Exchange," Mr. E. F. Price; April 1: Annual general meeting; April 5: "Central Battery Working—Subscribers' Equipment Modified and Otherwise," Mr. R. Dolman.

Dover.—A general meeting of the East Kent Telephone Society was held in the district office, Dover, on Sept. 17. The minutes of the general meeting were read and approved, as was also the secretary's report. It was unanimously decided to continue the meetings of the society during the winter of 1909-10. It was also resolved to ask the Provincial Superintendent, Mr. C. J. Phillips, to continue to be president for the ensuing session, and to ask Mr. A. E. Cotterell (Assistant Provincial Superintendent), Mr. C. F. Ashby (District Manager), and Mr. H. J. Corke (Local Manager, Folkestone), to be vice-presidents.

Leicester.—The annual meeting of this society was held on Sept. 1, and the following officers were elected for the ensuing session:—Hon. president, Mr. A. Coleman; president, Mr. M. Marsden; vice-presidents, Mr. L. Price and Mr. H. Marshall; hon. treasurer, Mr. G. E. Thorpe; hon. secretary, Mr. R. F. Ellison. Committe: Messrs. Warren, Pearson, Sansome, F. Lucas, E. Rendell, W. Baker, Garrard, Derrick, and Bailey.

Cardiff Operators.—A general meeting was held on Sept. 6, to appoint a committee for the coming session. Mr. W. J. Marsh, vice-president, presided over a large gathering. The District Manager, Mr. B. Waite, was re-elected president, and the following were re-elected vice-presidents:—Messrs. J. James, J. D. Duncan, W. H. Kirk, S. F. Whetton and J. Riley, with the addition of Mr. A. E. Rylands, who has recently joined the Traffic Department. Miss H. Spearing, Clerk-in-Charge, was elected secretary, vice Miss E. Van Riel, who retires. The following four ladies were elected on the committee:—Miss E. Van Riel, Miss L. Wheeler, Miss E. A. M. Bryant and Miss H. A. Faulkes.

The first committee of the session was held on Sept. 13, when the following preliminary syllabus was arranged:—Oct. 12: Competitive night; Nov. 9: Two papers on "Operating Irregularities"; Jan. 11: Competitive Night; Feb. 8: Paper on "Supervising," by Miss E. Van Riel; March 8: Competitive night. Dec. 14 has not yet been definitely arranged, but it is hoped to complete same very shortly. A very interesting session is anticipated.

Paisley.—The members of the staff here have unanimously decided to start a telephone society, and at a meeting held in the local office the following syllabus was drawn up:—Oct. 8: Opening address, Mr. A. Ramsay Lamb; Nov. 12: "The Receiver," Mr. W. Leithead; Dec. 10: Social evening; Jan. 14: "Line Construction," Mr. W. M'Phail; Feb. 11: Social evening; March 11: Mr. A. W. Grant; April 8: Business meeting and social evening.

Gloucester.—A general meeting was held on Sept. 13, presided over by Mr. C. Elliott, District Manager, to discuss the session 1909-10 and arrange matters on a working basis. Much enthusiasm was displayed by a good attendance of the staff, numbering 25. Stroud members were represented by Mr. C. M. Ffrench, Local Manager. The accounts and balance sheet having been submitted and unanimously agreed to the following were elected for the present session:—Mr. R. A. Dalzell, Provincial Superintendent, president; C. Elliott, District Manager, and W. J. Norman, Chief Clerk, vice-presidents; S. G. Hare, hon. secretary and treasurer. The first meeting of the session will be on Oct. 14, when the District Manager has very kindly consented to give an opening address on "Telephone Progress, Past and Present." The hon secretary was requested to ask the favour of a visit from Mr. R. A. Dalzell,

Provincial Superintendent, and Mr. Eustace Hare, Assistant General Superintendent, and all members are anxiously looking forward to their reception and valuable papers.

Bournemouth.—A telephone society has been formed in this centre, with a membership of about 60 per cent of the whole staff. It has been arranged to hold the meetings monthly during the first session, and a representative syllabus has been got together. The following officers have been elected:—Mr. E. Harper, chairman; Mr. F. Beal, hon. secretary and treasurer; committee: Messrs. S. A. Blewden, L. Hunt, W. J. Manns, W. J. Moore, Miss B. Guy, and Miss C. Harper. An inaugural meeting was held on Sept. 20 at which there was a good attendance, and an address was given by the District Manager (Mr. W. Howe) on the advantages these societies afford in diffusing knowledge on the complex branches of telephony amongst the staff. The next meeting will be held on Oct. 11, when papers will be read on "The Annual Meeting of Officers 1909, and its Bearing on our Local Arrangements," by Mr. F. W. Richards, Chief Clerk, and Miss C. Harper, Clerk-in-Charge.

Plymouth.—A general meeting was held on Monday, Sept. 13, when the secretary gave a report in respect of last session, after which the officers for the forthcoming session were elected as follows:—Chairman, Mr. G. Hooper; vice-chairman, Mr. A. E. Ball; secretary and Treasurer, Mr. G. A. G. Evans; librarian, Mr. W. H. Jones; auditor, Mr. A. Bennett; committee, Messrs. Wran, Walton and Meikleham. The session will commence early in October.

STAFF GATHERINGS AND SPORTS.

Sheffield.—The return cricket match between the Nottingham and the Sheffield staffs was played at Sheffield on Aug. 28, and resulted in a victory for the home team. The visitors were afterwards entertained to tea at the Mikado Café, thus terminating a very enjoyable day. The Sheffield National Telephone Cricket Club has had a very successful season, having won the "Sheffield Works League" cup without losing a match. The record for the season reads: Played, 16; won, 15; lost, 0; drawn, 1. The drawn match was not played to a finish on account of wet weather.

Nottingham Factory.—The Dismantling Department and friends, to the number of 55, held their annual outing on Aug. 21, visiting East Leake. Despite the wet weather, a very enjoyable time was spent. The sports included 200 yards flat, three-legged, boot and wheel-barrow races, tug of war and a football match, the two latter resulting in the "Dismantlers" defeating the "Friends." After a hearty tea the prizes were distributed to the winners of the various events.

The Switchboard Department held their annual outing on Aug. 21, visiting Woodhouse Eaves. Sports were indulged in, the cricket match, Married *versus* Single, resulting, after an exciting game, in the bachelors winning by four runs. The presentation of prizes and votes of thanks to the committee and secretary terminated a most enjoyable outing.

The Table Set Department visited Hoveringham on Aug. 28, on the occasion of their annual outing. Cycle and flat races, together with a cricket match in which the juniors defeated the seniors by 48 runs, were the chief events. Splendid weather prevailing, the outing was a complete success.

West Kent District.—At a Post Office swimming gala held at the Maidstone Baths on Sept. 7, the return team race between the Maidstone staff of the National Telephone Company and the Post Office telegraphists was one of the most interesting items, and the Nationals again won, but only by a few inches, after a splendidly contested race. The winning team was F. Oliver, C. Baldey, C. W. Fisher and S. G. Waghorn. A 60 yards handicap race was also hotly contested between the various departments of the National Telephone Company, and was won by S. G. Waghorn, of the office staff.

The summer, having been a wet one, seems to have driven thoughts to wet pastimes. A "Flying Squadron" team swimming race having been organised in Maidstone, the local National team competed, and at the Maidstone Baths on Sept. 15 was victorious in the first round. They now look forward with interest to the second round.

Swansea.—The district staff held their annual outing on Aug. 28, when a large party numbering nearly 100 spent a most enjoyable afternoon at Park Mill, Gower. The journey was made by brakes, Park Mill being reached at 3 p.m. The first part of the programme was a cricket match between the ladies and gentlemen, the latter being handicapped by having to bat and bowl left handed. The result was a victory for the ladies. Tea was then served in the mill, after which sports were indulged in, the various events being keenly contested. At the conclusion of the sports prizes were distributed by Mrs. W. E. Gauntlett, after which the return journey was made. On this occasion the engineering and construction staffs joined forces with the clerical, electrical and operating staffs, the result being most successful. The committee, Messrs. W. H. Crook, W. J. Hodgetts, H. G. McArthur, J. Radford and F. Stevens, are to congratulated on the result of their efforts.

Leeds.—*Engineers' Trip.*—On Aug. 21, 30 members of the Engineering Department, Leeds centre, spent a very enjoyable outing at Great Yarmouth. Leaving Leeds at 1.50 a.m. they arrived at Yarmouth soon after eight o'clock. During the day all the places of interest at Yarmouth and Gorleston-on-Sea were visited, and the party left Yarmouth at nine o'clock, arriving in Leeds shortly before 3 a.m., feeling very tired, but amply repaid for the strenuous day's efforts.

Aberdeen.—The combined staffs of the Post Office and National Telephone Company held a smoking concert in the Bonaccord Hotel, Market Street, on Saturday evening, Mr. Edwin Slader, Sectional Engineer, Post Office, in the chair. Among others present were Mr. E. E. Stockens, District Manager, National Telephone Company; Mr. Noble, Superintending Engineer, Post Office, London, and Mr. Fraser, Engineer, Post Office, Sunderland. The Chairman remarked that this was the first time within his knowledge that the Post Office and National staffs had co-operated in a convivial meeting such as this, and he was pleased to see such a large gathering. The time would soon be here when the National Telephone Company would be a thing of the past. The intricate work of jointing together 1,200 wire cables in Aberdeen had been carried out in a manner which reflected great credit on the staff and he was proud to state that in a few weeks time these would be handed over to the Company. Mr. Stockens suitably replied, and thereafter a very enjoyable evening was spent with song and sentiment.

North Midlands.—The Walsall staff together with several of the Wolverhampton staff held their annual outing on Aug. 14. The party numbering about 30, journeyed to Lichfield City. After visiting the cathedral and other places of interest, ample justice was done to a good meat tea, Mr. R. S. Grosvenor, Local Manager, presiding. Games were then indulged in, and a return made to Walsall at 9.30 p.m., everyone having spent a most enjoyable afternoon.

Cornwall.—On Aug. 21 the Cornwall staff held their record annual outing, which consisted of a drive from Truro to Flushing and thence to Trefusis, where a cricket match was played, Married *v.* Single, which resulted in a win for the married men. Mr. Wilkinson was captain for the married men and Mr. W. S. Griffiths for the single men. Mr. R. Harris, St. Austell, played a great game behind the wickets. Tea was afterwards taken and votes of thanks were passed to the committee, who were Messrs. Wilkinson, Local Manager, Mansfield; Chapple, Griffiths, and Sowerby. Mr. A. E. Bull, Chief Clerk, Plymouth, represented the District Manager, who was unfortunately unable to attend.

Edinburgh.—Over 60 of the district staff engaged in a ramble on Sept. 11. The route chosen was by steamer to South Queensferry, thence walking through Dalmeny grounds to Cramond, where tea was taken. A beautiful autumn day and a pretty road combined to make the excursion very enjoyable. Much credit reflects on the junior members of the staff who have organised the three rambles held this season.

Birmingham.—On Aug. 28 the Birmingham staff held their annual picnic at Sutton Coldfield. The party made the journey by coach and by rail. On arriving at Sutton they at once proceeded to the magnificent park, for which Sutton is so justly famed. Boating and other amusements were then indulged in till teatime. After tea sports were held, the football match proving the most attractive item. Contrary to all expectations the weather was perfect and a most enjoyable time was spent.

Ipswich.—The annual staff outing was held on Aug. 21 and took the form of a drive through the beautiful Constable country to Dedham. After justice had been done to a good and well-served dinner the event of the day took place, when the district office beat their opponents, the local office, in a rowing match of four miles for the "District Challenge Cup." An impromptu concert was afterwards held at which the District Manager, Mr. Mackie, presided. The return journey was undertaken in easy stages, but was eventually accomplished.

Exeter.—The annual staff outing took place on Aug. 28. A party of 30 journeyed to Seaton by the London and South-Western Railway, and a most enjoyable time was spent. The arrangements were made by Miss Lewis and Messrs. Humphriss and Martin.

Glasgow.—The operating staff of Douglas Exchange held their annual evening cruise on Tuesday, Aug. 31. The company, which numbered about 170, journeyed by special train from St. Enoch Station at 6.15 p.m., and on arrival at Princes Pier, Greenock, joined the turbine steamer *King Edward*, which then proceeded to Rothesay. Tea was served on board. The weather was fine, moonlight adding to the pleasure of the sail, and altogether the cruise proved most enjoyable.

SPECIAL CLASSES FOR NATIONAL TELEPHONE COMPANY'S EMPLOYEES AT THE MANCHESTER SCHOOL OF TECHNOLOGY.

FOR the second year in succession classes in telephony, especially designed to meet the requirements of the Company's staff, have been held at the above school. Thirty-three students were enrolled for the advanced stage and 42 for the elementary stage. The examination was held on May 4, and the following results obtained:—

ADVANCED STAGE.

(Lecturer G. S. Wallace, Chief Electrician.)

First-Class Certificates.		
Ashcroft, C. J.	Meldrum, F. A.	Satchwell, W. A.
Bromham, W. A.	Myers, W.	Schliffe, H.
Hill, R.	Reed, H. L.	Wallis, G. B.
Second-Class Certificates.		
Akister, F.	Hepplestone, H.	Payne, C. F.
Caldecott, H.	Hollingworth, H.	Williamson, J.
Davidson, S. F.	Marsden, L.	
	Failures, 8.	

ELEMENTARY STAGE.

First-Class Certificates.		
Blacon, W. I.	Holloway, A.	Taylor, G. H.
Hindle, J. M.	Medford, G. J.	
Second-Class Certificates.		
Bell, B. A.	Hardie, R. S.	Mangle, J.
Clark, M.	Knight, T. B.	Mentaste, R.
Cretney, F.	Lythgoe, T.	Wilson, J. H
Downham, J.	Mahoney, F.	
	Failures, 9.	

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TELEPHONE MEN.

XLII.—JAMES STIRLING.

JAMES STIRLING was educated at Forfar Academy, where he obtained "firsts" in English and French and a good grounding in mathematics. The love for English literature then instilled into his mind still remains, and he has lively recollections of the scenes in the old class room when the famous and well-worn passages from *Macbeth* or "The Deserted Village" were being declaimed. He entered the Company's service 25 years ago as operator of the small exchange at Forfar. To a boy of fourteen, fresh from school, everything connected with so recent an invention, as the telephone then was, naturally had an immense interest.

After a year of operating, Mr. Stirling was transferred to Dundee, and for a short time was on the instrument staff, both fitting and inspecting being done by the same men. By the way, very little of the latter was done at all as competition with a local company, and consequent cutting of rates, resulted in almost exclusive attention being paid to acquiring new business. As usual, the weaker concern ultimately went to the wall and the National was left in possession of the field. At this time Mr. Stirling had his first experience of snowstorm devastation. Almost every wire in the district was down, and even the boys were sent with the gangs to help, and he still retains an impression of the grit, endurance and zeal of the outside staff under very trying conditions.

Mr. Stirling was next transferred to the office, and during the ensuing ten years he learned to play, in a fashion, wellnigh every part in the telephone drama. The most outstanding feature of that period was the building of the trunk route to Aberdeen, Mr. Stirling being entrusted with the work of obtaining the wayleaves in the Forfarshire section, a total distance of about 30 miles. The interviewing of farmers was a lengthy business, each one requiring a full explanation of the telephone and all its ways, the upshot generally being a warning shake of the head, as if to say "What's the world coming to?" The wayleave was always granted, and often a substantial meal as well.

At the office on one evening each week a class was conducted by Mr. J. D. Miller, then district manager, and there Mr. Stirling was initiated into the mysteries of magnetism, electricity and telephone construction. Those lessons he afterwards found of immense benefit.

In 1895 Mr. Stirling went to Sheffield as Chief Clerk, and came under the influence of Mr. G. F. Preston, now General Manager of the London Post Office system. Hard work was the order of the day, as a local competitive company had recently been acquired, and much *débris* which had resulted from the upheaval had necessarily to be got out of the way. While at Sheffield Mr. Stirling had opportunities of becoming acquainted with various phases of underground work. At the evening classes of the Technical School he had the satisfaction of obtaining the class prize in elementary magnetism and electricity.

In 1898 he went to Hastings as Local Manager. The first undertaking was the conversion of an earth circuit into a metallic system, and an overhead plant into an underground, whilst the antiquated switchboard was also superseded by one more up to date. The varied combination of offices which a Local Manager has to fill gives a certain charm to the life, but on one occasion when he was suddenly left, in the middle of a change-over, with only two boys to do all instrument faults, inspections and fittings, he found the variety quite disproportionate to the charm.

No sooner was everything shipshape than, at the end of 1900, he was sent to Ipswich as District Manager. Here more conversions

and more underground occurred. Time was also found to open two new exchanges. The two largest undertakings were the removal of the exchange at Southend-on-Sea and an underground scheme at Ipswich.

In 1903 Mr. Stirling was instructed to assume the District Managership of Chester and North Wales in succession to Mr. Harvey Lowe, whom, by a curious coincidence, he afterwards followed in his present post. Five new exchanges were opened during his tenure of office and he is proud of the fact that a successful, albeit small, telephone society was formed. In the old cathedral city itself he made many friends and had most cordial relations with all the public officials.

At Portsmouth, whither he was transferred in March, 1906, the Company was in the throes of competition with a Municipal exchange. The difficulties, the worries, the vexations of a competitive area need not be described; they must be felt to be understood. No doubt, in addition, the heavy expenses involved were decidedly repugnant to his Scottish nature. One feature which he remembers with the keenest pleasure is that, in the midst of acute controversy and fierce partisanship, he was always treated with the utmost courtesy and kindness by the heads of the various Municipal Departments. The formation of a large telephone society and a keen interest in Head Office Correspondence Classes were two out of many pleasant associations with the Portsmouth staff.

Whilst at Florence in the autumn of 1907, Mr. Stirling was notified of his appointment as Metropolitan Chief Accountant. On coming to London he found it necessary to alter his perspective and adjust it to new conditions and a wider horizon, for London effaced all his preconceived business notions and ideas.

Of the various honorary positions Mr. Stirling holds, those he values most are the vice-presidentship of the London Telephone Society, the vice-chairmanship of the Metropolitan Local Committee of the Staff Transfer Association, and that of delegate to the Hospital Saturday Fund Board, perhaps for the reason that the duties are a little less nominal than those attached to the other honours which a London chief officer has thrust upon him.

Among his recreations have been cycling in Suffolk and boating on the Dee; he has also dabbled in photography, but has not yet found salvation in golf. His favourite recreation is walking. He is a lover of Continental holidays and has visited various parts of France, Switzerland, Italy, Holland and Norway. Above all, he is a lover of books, those friends with whom we never quarrel, who tell us of our faults kindly and remind us of our ignorance without offence.

As will be seen from the above particulars of Mr. Stirling's career, it has been one of a most varied description, enabling him to obtain a wide knowledge of the telephone business.

His many promotions testify to the value placed upon his services by the chiefs under whom he has served, and although it is only a little over two years since he entered upon his present duties, he has more than fulfilled all the expectations that his appointment aroused. In every movement affecting either the Company or the staff he quickly took and has not failed to maintain a prominent position.

His relations with the staff is at all times friendly, and he never fails to bear his share of the social side of the duties involved by the position he occupies.

CARDIFF OPERATORS' THRIFT CLUB.

THE above club held their general meeting on Tuesday evening, Oct. 5. Mr. W. J. Marsh, vice-president, presided over a gathering representing 73 per cent. of the total members.

The secretary, in giving her report, pointed out that the year ending Sept. 30, 1909, had been the most successful since its inauguration. The balance carried forward from the previous year being £24 12*s.*, whereas the balance now carried forward was £35 12*s.* 3*d.*

The deposits for the financial year just ended amounted to £145 7*s.* 5*d.*, which represents £2 19*s.* 4*d.* per member, as compared with the deposits for the previous year of £114 2*s.* 2*d.*, or £2 11*s.* 10*d.* per member.

It is very gratifying to find the club is going on so satisfactorily, and it has been found of considerable benefit to each one of the members in many ways.

CONTROL.*

BY EUSTACE HARE, *Assistant General Superintendent.*

WE are all familiar with the fable of the match between the wind and the sun as to which should first succeed in making a man take his coat off, likewise with the issue of the contest, which was that the sun scored an easy victory.

No better example could, I think, be produced to typify the triumph of influence over force or to exemplify the superiority of the one over the other, or to define the difference between the two. Up to a point both were successful, in so far as both desired to control the man's actions and that he obeyed, but by different ways. Force drove him to retire within his armour, hedgehog fashion, in sullen defiance; influence induced an appreciative compliance, willing and unresentful. The one failed by following the blind methods of the bull and the other succeeded by the exercise of observation, and reason, and the moral of the tale is that control, successful and complete, is a matter of thought rather than will and of knowledge rather than force.

Herein lies the whole position, nutshelled by the ancient Æsop, and if we could leave it here the simple fable might stand both for prologue and peroration; but as since Æsop's day control with neither reason nor knowledge has more than once been attempted, something may still be found to furnish reflection.

We need no philosopher to tell us that without reason we get chaos, and that the outcome and end-all of control is order; and this being so, it is manifest that our control is but a spurious imitation unless reason lies at the foundation and our reasoning powers become a daily habit, constant and permeating. Therefore I introduce the suggestion of reasoning at the outset.

Now we are commonly prone to regard force as something palpable, visible and tangible; something to be felt or something to be engineered; whereas, of course, what we see or feel is the result of a guided, or misguided, energy—invisible, intangible, but none the less real and far more abiding. The steam hammer and battering ram are but inert masses till directed by a controlling agency. The very wind, we are told, is the mere servant of the sun's rays, as they beat on other continents; and thus we have always to seek behind the seeming obvious to find the controlling source.

Again, many of us are inclined to view personal control in the light of a position of importance and authority thrust upon the individual by a fortuitous combination of circumstances like greatness upon Malvolio through the virtue of his yellow stockings, forgetting that Malvolio found himself deceived, as will everyone who imagines that place, power and ultimate success are to be attained by tinselled and superficial show.

Real control is the essence of strength, and success is the result of control; a two-edged virtue, born with our schooldays, at once master and servant, and perpetuating both functions throughout our careers—be we so minded.

For the purpose of this paper I propose first to attempt a short analysis of control by dealing with what seem to me six of its chief constituents, and to divide these into two groups of three each, one group representing the inner and invisible side of the art and the other the outward and visible evidence of our proficiency in its practice. The first group consists of thought, reasoning and knowledge; the second concentration, arrangement and order. The first group might stand for the work of an artist as depicted in his brain, the second for the production of the same, more or less successfully, on the canvas; for you may observe that while each part leads up to the other, the last three are the visible signs of the first.

It is a commonplace to say that a particular man is a born ruler—or a born something—by reason of his personality, his individuality; which means, I take it, that he is abnormally endowed with a mysterious power, marking him as a leader or exponent in some defined direction, be it as author, soldier, lawyer, financier, what you will. It would perhaps be more accurate to say "born with a capacity for ruling," etc., rather than "a born ruler," for it is impossible to imagine any such personality achieving its

* Paper read before the Telephone Societies of London and Cardiff.

destiny, founding a school or leading an army, unless its possessor be a thinker. Otherwise he may be highly ornamental as a "lion" possibly, or the leader of a passing fashion, but about as *useful* as a display of fireworks; and such examples are usually to be found among the legions of imitators—weaklings who, having nibbled off a crumb of truth, plume themselves on the possession of the whole loaf, mistaking their insignificant corners for niches of fame, thinking by a catch-phrase or tricks of gesture to out-Cæsar Cæsar; dead leaves to be swept away with last year's rubbish to make room for healthier growth. The thought, the idea in the rough, is the first step, but it wants the mallet and chisel.

For even the genius, the giant, must do more than think if he is to get beyond the stage of the dreamer. Thought undigested or ill-regulated is a useless commodity to the thinker, though it has been known to fructify when casually tossed to a reasoner, who has even occasionally profited thereby; some men being good at laying foundations, and others at building upon them.

And herein lies the first evidence of control-failure, not uncommon. It is difficult to understand how the conception of a great idea can synchronise with an inability to follow it up, an insufficient patience to work it out, and a want of reasoning power to fathom its possibilities; but it does sometimes happen. To how many men, for example, think you there occurred the doubt that the world was flat or that the sun went round it? There was the bare thought possibly in the minds of many, but the greatest discoveries the world has ever known came not from a sudden full-grown inspiration, but from reasoning minds, controllers of thought, who watched the ship as it came into view over the horizon, or set themselves to account for the shape of the moon in her varying phases, and then formulated their theories.

And in the wake of those theories followed the attendant fact, the solid knowledge, the product of reasoned thought—not without opposition, partly envious and partly ignorant—to flood the world with new matter for reflection and investigation, and to provoke a mighty impetus to new thought and enterprise.

But there is a danger in the sudden letting loose of a dazzling fact among an undisciplined and untrained multitude, just able to grasp its import without having trodden step by step the path of the man who brought it to light; and the danger lies in the floating of wild schemes, premature and immature, for the realising of immediate profit from an invention or idea that may have taken years of study and application to complete. And all for a break in the continuity of the chain of control; a break at the important boundary line where the patient, painstaking man of science hands over the result of his reasoning and knowledge to an expectant, impatient and unreasoning community.

So much, very briefly, for an introduction to the inner working of the art of control, for the embryo thought, for the reasoning we bring to bear upon the thought and for the ultimate knowledge produced therefrom.

I now turn to three visible constituents of control, viz., concentration, arrangement and order; and a peculiarity of these three combined is, that while they teach us what control is, they also teach us how it should be exercised, and what is its result. For, as I have already said, control is both master and servant.

Before going to the trouble of concentrating ourselves on a particular subject, it is useful to put the question, "What am I setting out to do?" and then, "Is it worth the trouble?" and if we settle both satisfactorily, the next step is to focus the objective and to keep it constantly in view. This may appeal to us as the easiest thing in the world; but, is it? My experience is—it is perhaps unusual, but there it is—that not only have I found myself on occasions in bye-paths which lead nowhere, but also at different points of the compass from that I am endeavouring to reach, and, what is most exasperating of all, back at the starting point empty handed. Such baulkings may to some extent be unavoidable but they certainly represent lost time, and are largely preventable by a more frequent taking of bearings and closer concentration on the object.

It is, of course, absurd to expect always to make a bee-line to the goal; and if a railroad cannot be laid by tunnel or cutting or bridge, the obstacle must be got round somehow; but an engineer who skirts rivers, or meanders over fields without keeping his eye on an imaginary straight line, has mistaken his calling. At the same time, concentration on the whole is but half the battle; there remains concentration on detail; to divorce the two is to think without reasoning. The statesman or lecturer would receive scant attention were he to try to convince his audience by reiteration of his main argument; not only must he explain himself point by point, but he must exhaust each point step by step and clear it out of his mind; to go back to it is to damage the effect.

Once concentration and the practice of never starting a fresh subject or fresh branch of a subject till the last one is cleared away have become matters of habit, the art of arrangement of the consequential arrangement of ideas becomes a comparatively easy study and a fascinating one; and is, in fact, both the positive evidence and direct outcome of successful control.

I am, however, in a little doubt here, and should be glad of some views on this point. There is no doubt in my mind that the habit of arrangement can be acquired in a greater or less degree by anyone who gives his or her mind to it, but can it be recognised as a gift in itself—as an innate power, full grown and complete, ready at the bidding of its conscious owner? Can it be regarded as anything more than an accessory to a cause or profession or to a greater fact? That it is essential to the scientist, the lawyer, the artist, the musician, there is no doubt; that many a genius has failed for want of training and insurmountable impatience in this respect there is also no doubt. But, supposing it be a natural gift, can it, for example, produce a mathematician without a really mathematical mind to work upon?

Who can tell how often and how long the world has had to wait in any or every department of knowledge or art for a new achievement, a new school, solely from a want of trained methods of arrangement, of the studied control of ideas? How many of us when investigating or admiring a new invention, or reading the work of a great author or listening to the creation of some musician, have been conscious of a sense of familiarity, and have thought, "There is nothing new here, I have often thought this. I could have done that, this ought to have been mine." Very good, and possibly true. Then why wasn't it? There is nothing unlikely in the fact that the same idea occurred to you and to the man who forestalled you, but the difference is that the latter, the man trained to concentrate and arrange, not only caught the inspiration, but reasoned it out and never turned till it became a reality, what time you merely thought or dreamed.

Or, I throw out another suggestion, perhaps to be judged fanciful, fantastic, perhaps true. Is it possible that the work of Shakespeare himself, although the apparent and visible result of one great mind, was really the accumulation of ideas and observations half expressed, ill expressed, or not expressed at all of thousands around him or who preceded him, all waiting for the receptive mind of one man to sum them up, who, in addition to receptivity and insight, possessed unrivalled powers of arrangement of thought, and who up to the present has said the last word in his particular sphere? Again, was Sir Isaac Newton really the first man to wonder why an apple falls to the ground, or was he merely the first to follow it up, reason it out, marshall his facts and thus bring to light the great law of gravitation?

In this age we move faster. Light upon light rather than line upon line, discovery following upon the heels of discovery, and inventions thrown on the scrap heap with the latest improvements scarcely ripened, until the provision for and manipulation of wastage has become a necessary precaution and a fine art.

If those who 70 or 100 years ago railed at the introduction of labour and time-saving appliances could have foreseen that the constant changes and improvements in these same appliances would in themselves create fresh fields for employment they would have perhaps exercised a little self-control and possessed their souls in patience.

At the same time danger and disappointment lie in undue haste, and if there ever were a time to apply the drag of judicious control it is the present, when cheap notoriety is the order of the day and a cheap press is ready to launch any wild and undigested scheme on a ready and credulous public. It is difficult to swim against the tide, but did we allow ourselves or were we allowed more time for deliberation, for the arrangement of detail and the focussing of the objective, we should hear less of the scrapping of types, whether of warships, switchboards or motor cars. Would

not, in fact, the world get the perfect thing sooner if it allowed more time to the thinker and inventor?

And arrangement of thought and ideas produces order, the visible sign and altitude of control, when the inventor or artist has nothing left to do but to watch the result of his handiwork, except, of course, to guard against the rusting of his powers. It has always seemed a strange thing to me that, surrounded as we are with such great models of order as the seasons, the tides, our solar system, our natural inclination is to be disorderly and our great difficulty is to keep perfect time and step. If a man, for example, keeps horses they must go faster than anybody else's, or if he possesses a voice his one desire is to cultivate a note beyond his natural compass and according to his success accounts himself happy; but I think we may take it that these miserly perversions of the natural order of things never do anybody very much good or advance any sound object.

This is, however, a bye-path from the subject of "order," and I will leave it altogether with a parallel. Perhaps no better illustration can be given of orderly control than the smooth gliding of a railway engine from its terminus out upon a long journey. There is the product of a long line of inventors doing a mighty work, swayed by one man, in turn controlled by the sense of his own responsibility; without fuss, and one might say paradoxically without hurry; pursuing an even way to its appointed end. Compare this with the motor car chauffered by the reckless, erratic road-hog with an accompaniment of dust and hooter and senseless haste, and you have control without order—largely indicative of our hurrying age.

Now the very essence of the telephone system is speed, but it must be, and is, a speed governed and permeated by order, scientific and commercial. Scientific, for it originated in the mind of a thinker who groped his way by concentration and reasoning till he achieved the knowledge of a scientific fact; commercial, because its primary object was the advancement of commercial enterprise and a medium of rapid commercial communication, and one can but speculate on the hopes and fears of the inventor when, his part ended, the work passed into other hands for the fulfilment of its purpose.

Not without its vicissitudes nor, maybe, a stumble or two has the telephone in this country passed through its youth and reached its present age of common usefulness, but I am not, I trust, exaggerating when I say that its era of pronounced success dated from the day when the Board in its wisdom appointed to guide its destiny our late General Manager, who, the embodiment of judicious control, set us an example of concentration and methods of orderly arrangement.

Without presumption, but in order to make my subject as complete as possible, I must remind you of this: that the man in the very highest position of control of any association or body whatsoever is himself controlled by an irresistible force, difficult to define and impossible to evade, viz., the force of circumstances; and the force of circumstances, rightly or wrongly, for good or evil, is not infrequently the dictator of policy; and when wrongly a baffling and pestilent taskmaster—even resulting in the leader being led.

For, as a whole, the multitude is invariably wrong-headed. Bring together 10,000 people and bid them choose by vote the best (in its highest sense) of half a dozen pieces of music, and they, accounting themselves judges, will choose the wrong one. Pass the same crowd through a great picture gallery with the same object and they will ignore a masterpiece for the latest sensational vogue, and what is more, will write down as a narrow-minded fanatic the man who points out its merits.

We have experience of this in our midst. With an overwhelming sense of its logic and fairness we have introduced a measured rate system, and what has been the result? An unreasoning, parrot cry on the part of the user: "Our calls will cost us more!" A blindness to the more efficient control of a service rendered for his own benefit and a disregard to the fact that he pays only for what he gets, whereas formerly he was less certain of getting it. In the meantime we know we are right and our detractors and critics wrong, which brings consolation if not profit.

This suggests somewhat the fashion in which leaders and rulers of great causes may be swayed and may even find it necessary to bend to public clamour, in the full knowledge of its unrighteousness, not to say mulishness.

As the scale of authority descends the super-control becomes more, and the sub-control less pronounced, or, in other words and conversely, responsibility rises proportionately with office; not, mark you, that anyone escapes responsibility, but that it gradually becomes less circumscribed and defined. For the constituent elements of control: concentration, reasoning and order, are equally necessary in every degree. "Theirs not to reason why" sounds well in verse and is compatible with martial law, but is not always desirable in the normal. Organise as you will, issue your service instructions by the ream and bind them with enough red tape to link up the Law Courts with the Horse Guards in graceful festoons and you will still find scope for personal discretion and responsibility, to say nothing of individual lapses of error and judgment.

And this brings me to the question of our personal control.

Control is part of the daily work of every one of us, ever present and ever necessary, even if only to be exercised over the work itself; and though the control of subordinates be added, the same methods and principles apply; and if this be true, it is clear that efficient, business-like rule will never be reached by mere personality, by an assumption of style or mannerism, charm we never so wisely.

Popularity will no more produce good work than it will strike a balance or effect a telephone call, neither will you find a display of distant superiority any more successful. Such littlenesses have no kindred in thought, reason and knowledge, the very qualities which influence the great minds which invented and are still inventing and perfecting our machinery; and it seems to me the soundest logic that the same means which produced the machine must remain an unbroken chain to the end.

Concentration results in the mastery of detail, and it is only by mastery of detail that you can acquire complete knowledge of whole facts; the absence of it induces slovenliness and inaccuracies, the parents of disorder; and as authority is given us specially to promote order, the neglect to recognise and cultivate its primary parts will spell failure. This may sound a truism, but it is important if only for the fact that detail usually means monotony, and monotony is a deadly enemy to concentration.

It has been, and is, the lot of most of us to serve a long apprenticeship to this uninteresting tutor of control, and in my view the close concentration and attention of the mind to daily recurring sameness is the most difficult of all forms of control. But in its mastery lies the foundation of coming success, and consequently of the success of the undertaking of which we are the moving power.

There are two classes of the Company's staff which are peculiarly susceptible to monotony, and to which, therefore, the practice of concentration is especially necessary, viz., clerks and operators. What is the foremost quality of a good clerk? That he shall not make mistakes; and when we think of his eternal juggling with nine numerals and a cipher thrown in, we wonder that his particular province is not so much to avoid mistakes as to correct them.

And yet there are few studies more fascinating than the twists and turns of figures and statistics, and the clerk who adds thought and reason to his reliability is on the high road to success. Provided he be fairly dealt with by his immediate chief—but this is another story—his career in a substantial undertaking like ours is assured. The strange thing is that, comparatively, so few clerks aspire to know the higher branches of their calling, limiting their efforts to the work in hand rather than girding themselves for the next rung of the ladder. I am telling no secret when I say that one of the most difficult tasks our management has to meet is to find a really competent chief clerk when a vacancy occurs; a man who possesses both knowledge and ability to control.

What is the reason? With so many men who have ascended the whole gamut of office work it surely cannot be want of knowledge, and with so many sub-divisions of authority around them there is no lack of opportunity for observing the controlling methods of others, with, may be, examples to be avoided. The difficulty must lie either in the inability to hold an equal balance between the work and the individual or to apply the same methods of concentration, reason, etc, in controlling and knowing the individual as have been practised in mastering the knowledge of the work.

In case I have not made this clear, let me put it in another way; and although I am referring immediately to clerks (being the class of staff I know best) the same theory, if I am right, applies generally. I have put forward the view that even the novitiate has something to control, viz., the methods of and order in his work, and to do this successfully he must habituate himself to the elements of control, some of which I have enumerated. If he has learnt and mastered the details of his work by their means, it is not a far step for him to recognise, or at all events to speculate upon the idea, that the same means can be as usefully employed in controlling not only the work as a whole, but those entrusted to carry it out. For years, perhaps, he has centred his powers on the attainment of bookwork knowledge and in accumulating facts. He has now to apply the same attention, the same concentration, reasoning, methods of arrangement and order on the individual until he has attained full knowledge of him also, of his capabilities, shortcomings and peculiarities.

Now every clerk enters on his career with some preparation for the work before him, if only with the use of pen and ink; and presumably everyone foreseeing his destiny undergoes some sort of training before actually putting his hand to the plough, and he or she goes on till the hand becomes expert. But what is more rare is for the man or woman to take time by the forelock and recognise that the day will surely come when he or she will be called upon to relinquish detail and command and guide others and prepare for it, rather looking upon authority in the light of a bestowed gift to be used and wielded mechanically, in much the same manner as the wind blows.

Nothing is more unreal or more fallacious; the mantle of Elijah would not have fallen upon Elisha had he not shown himself the fit person to wear it; Napoleon Buonaparte was not born an emperor, nor would he have risen to his high place had he not step by step taken measure of his surroundings, combining knowledge of men with that of the art of war.

(To be continued.)

THE TAXICAB AND THE TELEPHONE.

IT is not, perhaps, says the *Commercial Motor*, generally realised to what a considerable extent the taxicab service of the Metropolis differs from those in the majority of provincial towns. In London, and in some few of the largest communities in the provinces, now that crawling is a police-forbidden as well as a petrol-wasting method, the cab-rank plays the most important rôle in the organisation of this branch of public passenger-carrying service. It is not so, however, in the ordinary county town. There, the casual hirer is by no means the most important member of a motor cab-owner's *clientèle*; the telephone service is the channel by which the largest proportion of the purely provincial motor cab business is secured. . . . The booked contract for week-ends, and for special and lengthy runs, is, in the main, the perquisite of another branch of the business—the private hire department. Most of the London cab-owning companies detail a number of special machines for this latter class of work, and, in some cases, these are higher powered and better fitted vehicles than the ordinary taxicab of the streets. They may not, perchance, even be fitted with fare-recording instrument, and they may not bear the police licence plate. Their employment is wholly in the fulfilment of previously arranged contracts, most of which have been completed by way of the telephone. This is a true development of the ordinary jobmaster's service, and in London, especially, is it a separate and distinct branch of the motor cab business. In the larger organisations such business calls for a separate and distinct staff and garage equipment, and it is a branch of activity which has developed apace. One operating company has, for private hire, by the hour, day, week or year, over 150 lavishly equipped limousines, each with its distinctively uniformed driver garbed to match the paintwork; all these machines are innocent of taximeters or police plates. Although a direct development of motor cab exploitation, it is not taxicab business *per se*. It is solely private hire work, and is largely rendered possible because of the efficiency of the modern telephone service.

It is in the provinces—in the larger county towns and the smaller cathedral cities—that the telephone has played such an all-important part in the successful organisation of taxicab business. Owing to the limited extent of the closely populated areas, to the multiplicity of rate-aided and unremunerative tramways, to the more economical habits of the ordinary inhabitant, and to other such causes, hiring from the rank, except in the largest cities, has not proved a universal success. The man in the street in Leeds has not acquired the haphazard cab-riding habit of London's resident or visitor. The mile for a shilling with, in nine cases out of ten, an empty mile back to the rank, is not an attractively paying occupation for a motor cab, and it is in the development of new forms of service that the provincial taxicab is rapidly finding its *métier*. The proprietor of motor cabs in a county town must, to be successful, make it his business to ensure that everyone in the district knows where a taxicab may be obtained by telephone, just as surely as each knows where to telephone in case of fire or of the need of medical assistance. The most profitable circumstance for such a proprietor is emergency of any kind; service required in a hurry, and without premeditation, cannot be met in better fashion. It therefore behoves him to afford the necessary facilities to deal with emergencies conveniently, and these are at hand in the shape of the public telephone service rather than in a journey to a rank which may or may not be occupied. Call offices and private telephone subscribers, hotel porters and club attendants must be put into direct touch with the order office. The doctor called out into the country in the middle of the night, and who wishes to save his horses or his own car; relatives summoned to a sick bed in a hospital or in a private residence at a distance in the night time; the traveller who has lost the last train; the visitor stranded at a country house in inclement weather—these and many other such victims of emergency are clearly potential users of any taxicab service, and the telephone is the ready means to the end. Then there are private parties—to dances, dinners, races and such gatherings; emergency journeys to other towns and villages in the district, and to colleges, asylums and other institutions outside the town. None of this business is, as a rule, secured on the rank, but it can all be encouraged on the telephone. A skilful enlistment of local telephone facilities is rendering many provincial motor cab services highly remunerative, but on quite new lines, and not on those of the old horse-cab trade.

AWARDS FOR INVENTIONS, SUGGESTIONS, ETC.

	£	s.	d.
C. Mace, London, apparatus for transferring steels and cables from one pole to another	1	1	0
C. H. Toms, Head Office, "no lines" test on straight order wire	1	1	0
F. G. C. Baldwin, London, combined pot-head and subscribers' instruments protector	2	2	0
G. E. Williamson, Exeter, pencil holder for pad clip	2	2	0
,, ,, pad holder and clip	2	2	0
J. Johnson, London, embossed instructions on automatic boxes	2	2	0
F. H. Copeland, Ipswich, Delafon cells	2	2	0
J. G. Whittle, Liverpool, cord repairing gauge	2	2	0
D. Kirkwood, Dublin, test plug with steel blades	2	2	0
F. G. Brown, London, combined hand pump and calcium cylinder	0	10	0
C. A. Chadd, London, tool for removing metal sheath covers	2	2	0
G. Price, Cardiff, battery boxes	2	2	0
Miss A. Chance, Dublin, marking party line multiple jacks	2	2	0
F. C. Scannell, Dublin, plug clamping rings	2	2	0
J. Webb and J. Jenkins, London, method of testing supervisory relays	2	2	0
T. Rodger, Glasgow, ticket boxes for exchanges	2	2	0
A. J. Aldridge, Head Office, slide rule of telephone transmission calculations	2	2	0
W. K. Wood, Liverpool, doing away with side tone talk at Royal Exchange	2	2	0
A. Covell, Liverpool, alteration to Forms No. 1221-1223-A-B	2	2	0
J. W. Fairhead, Norwich, register records	0	10	0
J. Dixon, Liverpool, alteration in the ruling of stores issue sheets	0	10	0
H. J. Raines, Luton, automatic box collecting book	2	2	0
J. O. Eardley, Bristol, stores requisitions	2	2	0
H. Murray, Glasgow, receipt for the payment for excess calls	2	2	0
A. K. Blackburn, Oldham, sending cheque requisitions to Head Office fortnightly instead of weekly	2	2	0
F. Wray, London, fitting of weather vane to ground poles	0	10	0
D. Strachan, Swansea, ratchet and draw tongs	2	2	0
J. W. Hambleton, Notts Factory, improvement in breast plate transmitters	2	2	0

Grants for obtaining Medals.

J. N. Hindle, Manchester	£3 (bronze medal)
R. L. Bell ,,	£3 ,,
J. W. Wheeler, Head Office	£4 (silver medal)
A. W. Ashbee, Bristol	£4 ,,

SAVINGS BANK SOCIETY GLASGOW TRAFFIC DEPARTMENT.

THE beginning of the month (October) saw the end of the first year's working of this society, which was formed to encourage thrift among the members of the Traffic Department staff. The result of the year's operations has been most encouraging, the total amount deposited in the eight branches operating under the auspices of the society being £447 13*s.* 4*d.*, the credit balance at the same date being £124 7*s.* 4*d.*, which amount, but for the fact that depositors are encouraged when they have £1 at their credit to open an account in their own names in the National Security Savings Bank, would have stood at a much higher figure.

It is not over-stating the case to say that many have, by reason of the ready facilities afforded them, accumulated savings which otherwise would not have been done.

The cash is banked with the National Security Savings Bank, an institution whose laudable efforts to encourage thrift are locally well known, and who pay interest on deposits at the rate of 2½ per cent. per annum. The society is indebted to them for providing pass books, cash books, and ledgers, a consideration which is very much appreciated.

THE TELEPHONE STATIONS OF THE WORLD.

By W. H. GUNSTON.

(*Concluded from page* 140.)

AUSTRALASIA.

Australia.—The latest official figures obtainable are those for the end of 1906. By comparison with the figures for the end of 1904 a fair estimate of the number of telephones existing at the beginning of the present year may be obtained.

	January, 1905.	January, 1907.	January, 1909 (estimated).
New South Wales	16,093	20,373	25,000
Victoria	8,824	10,546	12,500
Queensland ...	3,936	4,512	5,200
West Australia ...	3,448*	3,756	4,100
South Australia...	2,108	2,856	3 800
Tasmania ...	1,317	1,563	1,800
			52,400

No official information as to the telephonic development of the large towns could be obtained, but I am informed that in Sydney there are well over 10,000 stations, probably between 11,000 and 12,000. Melbourne with the next largest system cannot reach the former figure, having regard to the number of telephones in the whole colony of Victoria. The adoption of measured rates was recommended by Mr. Hesketh (now Engineer-in-Chief to the Commonwealth) in his report of March, 1905. There have been delays in putting these rates in force, and in the present political condition of Australia their adoption is likely to be still further postponed.

New Zealand.—The number of telephone connections in the Dominion at the beginning of the year was 25,974; 4,019 being in Wellington, 3,456 in Auckland, 3,193 in Christchurch and 2,895 in Dunedin. Nine years ago there were but 7,150 telephones in New Zealand, so that the number has more than trebled in that time.

With the addition of a few telephones in New Caledonia, Samoa and other places, the total number of stations in Australasia may be put at between 78,500 and 79,000.

SUMMARY.

	Number of telephones Jan. 1, 1909.
Europe	2,380,800
Asia	100,400
Africa	25,000
North America	7,040,000
South America	57,000
Australasia	78,800
Total for the world	9,682,000

There is little doubt that, at the present time, there are over 10,000,000 telephones in use in the world.

The following is a list of cities containing systems with 10,000 stations and upwards as at Jan. 1, 1909. It is believed to be complete. In a few cases (marked *) estimates have been employed, the basis for which has in most cases been given in the preceding papers:—

*a*New York	U.S.A. ..	326,907
Chicago	U.S.A. ..	169,134
*b*London	England ..	164,208
*c*Berlin	Germany ..	139,622
Philadelphia	U.S.A. ..	128,345†
Boston (Massachusetts) ..	U S.A. ..	109,300
St. Louis	U.S.A. ..	73,836†
*d*Stockholm	Sweden ..	70,011
Paris	France ..	65,033
Cleveland	U.S.A. ..	51,964†
San Francisco	U.S.A. ..	48,533
Kansas City..	U.S.A. ..	46,066†
*e*Glasgow	Scotland ..	43,928
Hamburg	Germany ..	41,809
Cincinnati	U.S A. ..	41,180
Buffalo	U.S.A. ..	40,125†
Pittsburg	U.S A. ..	38,805
*f*Copenhagen	Denmark ..	37,723
Baltimore	U S.A. ..	37,498
Detroit	U.S.A. ..	37,232
Vienna	Austria ..	35,011
Washington	U.S.A. ..	33,251
Los Angeles	U.S.A. ..	32,816
Minneapolis	U S A. ..	31,000
Milwaukee	U.S A. ..	27,891
Indianapolis	U.S.A. ..	27,027
*g*Liverpool	England ..	26,849
Denver	U.S.A. ..	26,012
Seattle	U.S A. ..	24,198
Toronto	Canada ..	24,182
Montreal	Canada ..	24,021
Columbus (Ohio)	U.S.A. ..	23,850†
Moscow	Russia ..	23,000*
Munich	Germany ..	22,160
Portland (Oregon).. ..	U S.A ..	22,098
St. Paul (Minnesota) ..	U.S.A. ..	22,000†
*h*Manchester	England ..	21,209
St. Petersburg	Russia ..	20,000*
Omaha	U S.A. ..	19,289
Frankfurt	Germany ..	19,230
Providence	U.S.A. ..	18,721
Tokio	Japan ..	18,589
Leipzig	Germany ..	18,556
Buenos Aires	Argentine ..	17,500
Oakland (California) ..	U.S.A. ..	16,639
Dresden	Germany ..	16,623
Cologne	Germany ..	15,686
Newark (New Jersey) ..	U.S.A. ..	15,572
New Orleans	U.S.A. ..	15,473
Christiania	Norway ..	15,198
Spokane	U.S.A. ..	14,521
Warsaw	Russia ..	14,000*
Buda Pest	Hungary ..	13,906
Stuttgart	Germany ..	13,750
*i*Birmingham	England ..	13,479
Brussels	Belgium ..	13,348
Dallas (Texas)	U.S.A. ..	13,020
Toledo (Ohio)	U.S.A. ..	13,000*
Breslau	Germany ..	12,619
Atlanta	U.S.A. ..	12,253
Jersey City	U.S.A. ..	12,133
Winnipeg	Canada ..	12,000*
Louisville	U.S.A. ..	11,681
Gothenburg	Sweden ..	11,241
Worcester (Massachusetts)	U S A. ..	11,150
*j*Sydney	N.S.W. ..	11,000*
*k*Edinburgh	Scotland ..	10,889
Düsseldorf	Germany ..	10,841
Hull	England ..	10,800
Amsterdam	Holland ..	10,660
Nuremberg	Germany ..	10,653
Syracuse (New York) ..	U.S.A. ..	10,521
New Haven..	U.S.A. ..	10,483
Richmond (Virginia) ..	U S.A. ..	10,152
Grand Rapids	U.S.A. ..	10,100*
Hartford (Connecticut) ..	U.S A. ..	10,052

†In these towns the *estimated* Independent figures have been added to the actual Bell stations. The Independent stations at St. Paul and Minneapolis were lumped together and have been divided proportionately between the two towns.

a Includes the boroughs of Manhattan, Bronx, Brooklyn, Queens and Richmond.
b Including area extending from Waltham Cross to Reigate and from Grays to Southall.
c Including Charlottenburg, Rixdorf, Wilmersdorf, Schöneberg, Lichtenberg, etc.
d Includes 70 kilometre area.
e Includes Partick, Govan, etc.
f Including suburbs.
g Includes Bootle, Birkenhead, etc.
h Includes Salford, Eccles, etc.
i Includes Aston, West Bromwich, etc.
j Including suburbs.
k Including suburbs and Leith.

Of these 76 cities 43 are in North America, 30 in Europe, one in Asia, one in Australia and one in South America, while in Africa there is no city possessing 10,000 telephones.

A comparison between the above-mentioned cities of the development of the telephones per inhabitant is attended with the difficulty that while the municipal area for which the population is taken may, in some cases, be co-terminous with the telephone area, yet in many instances this is far from being the case. I have, therefore, not worked out the proportion of telephones to population. Some remarks, however, with regard to London, Berlin and New York may be of interest. The 326,907 telephones in New York are within the densely populated bounds of New York proper (4,013,781, or one

telephone to every 12·2 inhabitants). The London telephone area with its 6,600,000 souls and 164,208 stations spread over 640 square miles (or one telephone to every 40·2 inhabitants) is handicapped in the comparison by a large outer rural belt and, in addition, by a large inner belt of only moderate density of population. I have already mentioned that within the county of London there is one telephone to every 29·4 inhabitants (154,000 to 4,536,541) but if we take the large, densely populated central area included in the cities of London, Westminster and Southwark, and the boroughs of Holborn, Finsbury, Shoreditch, Stepney, Marylebone, Kensington, Paddington and Chelsea and parts of Lambeth and Camberwell, we shall find there are 113,310 telephones serving a population of about 1,700,000, or one to every fifteen. As regards Berlin, the figures above given refer to Greater Berlin, but in the city itself there are 102,695 stations to 2,040,148 inhabitants, or 1 to every 19 9.

In conclusion I have to thank the Directors-General of Telegraphs, Secretaries of Postal Departments, officials of British and American Telephone Companies operating in various parts of the world, and Consuls-General and others who have kindly supplied me with figures and information for these articles.

TELEPHONE WOMEN.

LI.—FLORENCE H. DAVENPORT.

FLORENCE H. DAVENPORT, Clerk-in-Charge, Cheltenham, entered the Company's service in May, 1896, at the present Cheltenham Exchange. There were then about 200 subscribers in the area, and the switchboard was a 200-line single-cord board fitted with suspended Hunning's cone transmitters. The testboard has been described as "a miscellaneous collection of terminals, London pattern blocks and old pattern Coleman and Jackson arrester strips, hung up at the back of the switchboard." Each time a test was

FLORENCE H. DAVENPORT.

made a galvanometer and the necessary paraphernalia had to be joined up specially. Miss Davenport has served under four district managers and four local managers. She was appointed Clerk-in-Charge in December, 1899. Her responsibility has very much grown as there are now over 650 subscribers on the Cheltenham Exchange, and several sub-exchanges have been opened.

Miss Davenport has vivid recollections of a violent thunderstorm in 1898, during which about a quarter of the subscribers' indicators were fused, and incidentally the operators' nerves shattered for a week or two. In this same storm the fire station was struck and all the telephone apparatus fused, the London pattern arresters being burnt up and the whole of the insulation taken off the vulcanised indiarubber leading-in wires. It was necessary to change all the apparatus and re-wire the building.

Her chief amusements are music, dancing and cycling. She has been described as having "a way with her," and as being difficult to equal in soothing refractory subscribers.

LII.—ADA FLORENCE WEEKS.

ADA FLORENCE WEEKS, Clerk-in-Charge, Bath, entered the Company's service at Bath on June 14, 1897. At that time the telephone facilities in the neighbourhood of Bath consisted of an exchange at Bath only, which was equipped for 200 lines (the majority being on earth circuit) and had four operators.

ADA FLORENCE WEEKS.

She was appointed Clerk-in-Charge at Bath in September, 1906, and her bright manner and cheerful optimism has made her many friends. She is a firm believer in the principle of good operating being one of the most important factors in the development of the telephone service.

Considerable progress has been made since then, and Miss Weeks is now in charge of seven sub-exchanges in addition to Bath Exchange, the number of subscribers' lines having increased from under 200 to over 1,100, and the operators from four to nine.

Miss Weeks has no particular hobby, but is a practical believer in physical culture, and thinks it of the greatest benefit to those who take it up systematically. It goes without saying that an optimist is a favourite, and Miss Weeks is not only a favourite with her own staff but with all who know her.

OBLIGING.

SUBSCRIBER: What did you find wrong with my telephone?

LINEMAN: Your line was "short."

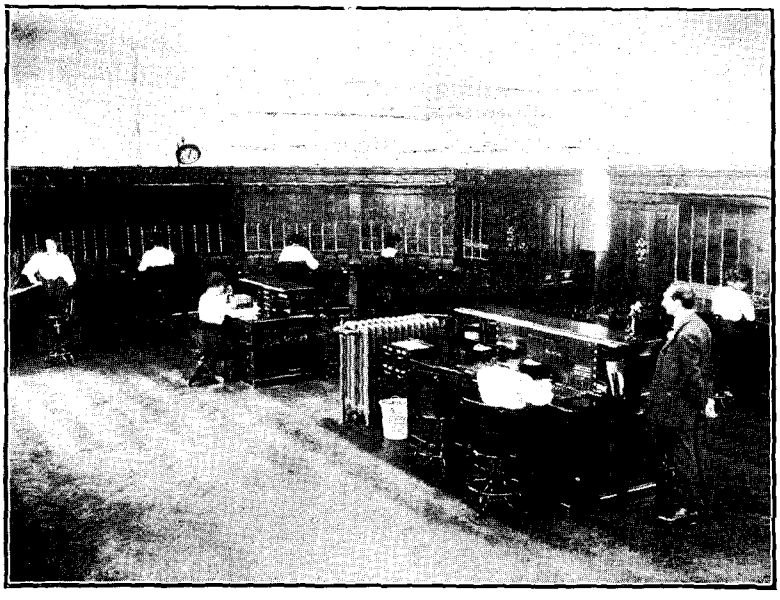
SUBSCRIBER: For goodness sake, we pay for a full-length line. I wish you would add a piece to the line, so that it will reach all the way to the house.

All of which was agreed to.—*Michigan State Gazette*.

THE TRANSFER OF DEPTFORD EXCHANGE.

By P. T. WOOD.

THIS exchange is the nineteenth central battery exchange opened in the Metropolitan area, and serves a district extending from Greenwich on the east to Peckham on the west, and from Lewisham on the south to the river on the north. It replaces an exchange fitted on the magneto system situated in New Cross Road, nearly a mile distant from the new premises. The original Deptford Exchange was opened in the year 1884, the number of subscribers in the year 1893 having reached the total of 67.



GENERAL VIEW OF SWITCHROOM

In the new exchange there are over 1,200 working subscribers' lines and 217 junctions to other telephone exchanges. The present capacity for subscribers' lines on the new exchange is 1,600, but this can ultimately be extended to 4,500.

The circuits in use are identical with those already described in a note on Dalston Exchange in a previous issue of the JOURNAL.

A point of interest in this transfer is this, that owing to there being only a limited number of spares available in the cables between the two exchanges, it was necessary to adopt some arrangement by which a number of cable leads could serve the double purpose of working subscribers west of New Cross into Deptford until the day of transfer, and of working subscribers east of Deptford into New Cross eventually. Over 400 pairs were used for this purpose. The method will be understood better by a glance at the accompanying sketch, where a Woolwich junction working into Deptford previous to the transfer was extended to New Cross by withdrawing a wedge from a test jack in Deptford testroom. The line, however, used for this purpose was previously serving a subscriber in the Bermondsey area. In order to cut this line promptly at the moment of transfer this Bermondsey line was brought through heat coils at New Cross on special arrestor strips. To test such a junction as that mentioned it was necessary first to cut it from the Deptford switchboard in the old testroom and remove the wedge that was temporarily cutting the line extension at that place. Then the Bermondsey subscriber had to be cut at both old and new exchanges, and finally the heat coils had to be inserted into the junction line at New Cross. It was then possible to prove the line through. Such testing has proved somewhat laborious, but the completeness of the records kept facilitated matters and no lines were lost.

The signal for the transfer was given by the Mayor of Deptford, Mr. E. Mumford Preston, J.P., the procedure adopted in connection with the ceremony being as follows:—

As soon as all connections were tapped off in the old exchange, word was passed to the new testroom, so that temporary heat coils could be withdrawn from the special arrestors. At the same time, the heat coils and temporary wedges were withdrawn at the old exchange. Upon completion of this work the new testroom was advised that all was in readiness for the transfer.

In the meantime, the Mayor and Mayoress, with a large party of aldermen and councillors, had arrived and been conducted to the switchroom by the Metropolitan Superintendent. Mr. Clay opened

THE MAYOR, ALDERMEN, COUNCILLORS AND VISITORS.

the proceedings with a few happy words of welcome, and the Mayor then spoke, timing the opening speech so that his remarks were completed just as the information was given to him that all was in readiness for the transfer. He immediately gave the signal to the staff stationed at the relay rack, who removed the wedges from the cut-off relays, thus putting all lines through on to the new equipment. The Mayor was the first to make a call on the New Cross

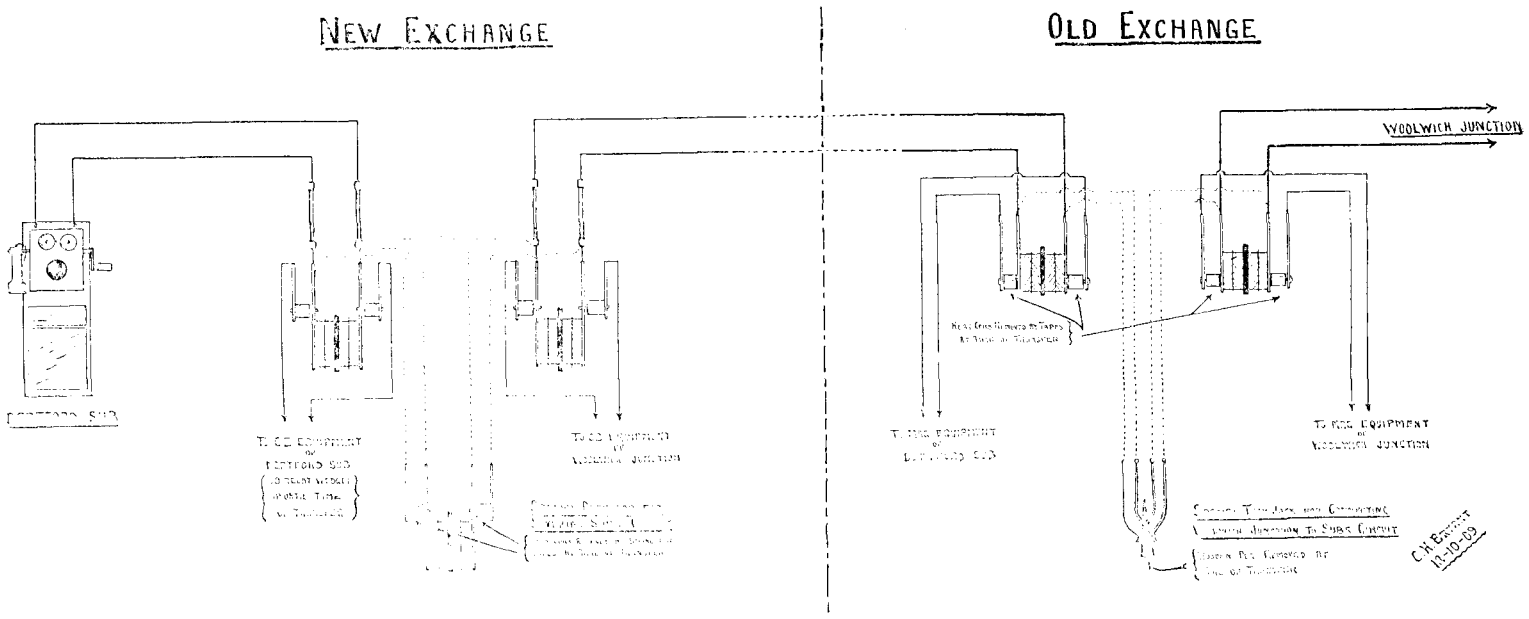
STAFF PRESENT AT THE CEREMONY.

Exchange, this being made to the Lord Mayor of London at his official residence. The working of the central battery system was then explained by Mr. Blight, the Divisional Maintenance Electrician, who used a series of models for this purpose. A tour of the exchange and premises followed, after which a photograph was taken of the visitors. Refreshments were subsequently handed round, thus concluding a very interesting ceremony.

I am indebted to Mr. Bryant for the very clear diagram shown.

SCHEMATIC DIAGRAM OF THE TEEING OF NEW AND OLD DEPTFORD EXCHANGES

TYPICAL CASE OF A JUNCTION UTILISING THE VACANT PORTION OF A SUBS CIRCUIT



TRAFFIC STUDIES.*

BY P. V. SANSOME, *Leicester.*

THE study of traffic is essential to the efficient working of a telephone system. It is not many years ago when the relation between the operators on duty and the traffic requiring handling was but hazily understood.

To my mind the telephone service will never be made quite perfect, because it must necessarily depend, to a great extent, on the human element, and humanity never has been, and never will be, anything but imperfect. An efficient telephone service must include the following:—

(1) Good design and maintenance of equipment.
(2) Speedy handling of calls.
(3) Accurate connections between subscribers.
(4) Sufficient supply of lines between subscriber and the exchange, also of junction lines between the various exchanges.
(5) Absence of all operating errors and irregularities, which minimise the value of even the best equipment.
(6) Good training of operators to obtain the best results.

A regular system of service testing is important, not only from the subscribers' instruments, but from the table fitted for the purpose.

This will have a beneficial effect upon the individual operator, since her work, of course, is liable to be under observation at any moment.

Its object is *not* to trace cases of slow and irregular operating by the operators concerned, but to show the service given by the exchanges under observation, and to point out the particular directions in which the service can be improved.

When properly used, it exposes weaknesses in the design of equipment, provision of junctions, maintenance of lines, apparatus generally, and traffic methods and arrangements. Hence operators must not run off with the idea that the table is fitted with just one aim, *i.e.*, to check their work alone.

The telephone call may be termed the unit of telephone traffic. By the number of calls accurately handled per hour an operator's ability is determined.

When a circuit is in use, more traffic cannot be placed upon it. In the same way when an operator is handling a call, she can handle but one at a time, and the facility with which she can operate connections depends, of course, upon the regularity with which the traffic comes to her. On unlimited or flat service work an operator can complete a maximum of from five to eight calls per minute, which works out at the rate of 300 to 480 per hour. It is obvious, however, that such a calling rate would result in congestion of the service, as a slight hold-up of the operator on the part of the subscriber would put her behind with her work, and with calls coming in at such a rate the service would quickly fall to pieces.

Other factors also enter into the determinations of the operator's ability. The personal equation, as made up by the operator's training, experience, temperament and supervision, is one. Another is the design and type of switchboard, the number of party lines in the plant, the method of ringing and clearing, and last, but not least, the quality of the maintenance.

It will be seen that the proper determination of the number of calls an operator can handle per hour and give efficient service, is not an easy matter.

It can only be obtained by a number of observations and careful experimenting.

An interesting curve which can be derived from the "peg count" is shown in Fig. 1.

In the records taken you have the number of calls dealt with each half-hour by each operator, and the dotted curve represents these calls.

On the left-hand side vertically I have put figures ranging from 80 to 140, and these represent the number of calls dealt with by each operator on the positions under test during the busiest half-hour. Horizontally the letters A, B, C, D, E, F, denote operators. A curve is then plotted by taking the total calls dealt with by each operator, A, B, C, D, E, F.

The average for the number of calls per operator works out at 114, and to this figure I have added 10 per cent. which represents overload, which therefore indicates a point 10 per cent. above the average. In similar manner the bottom horizontal line represents 10 per cent. below the average.

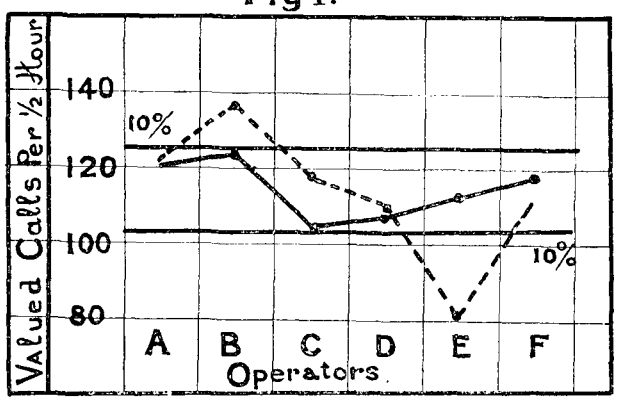
For good distribution and fair team work by the operators, the whole of the points should be within the two lines, as denoted by the curve shown with an unbroken line, *i.e.*, either 10 per cent.

* Abridged from a paper read before the Leicester Telephone Society.

above or 10 per cent. below the average for the whole, which I have allowed and consider a fair comparison.

Taking the broken line curve, we have operator B dealing with 136 calls, while operator E only takes 80. Then it might be taken that operators B and E are in need of a redistribution. In considering this matter you are bound to take several records and not an isolated half-hour. Operators should always be brought to understand that they are working as a team and not as individual members of the staff, and that by sinking individualism they obtain the highest efficiency.

Fig I.

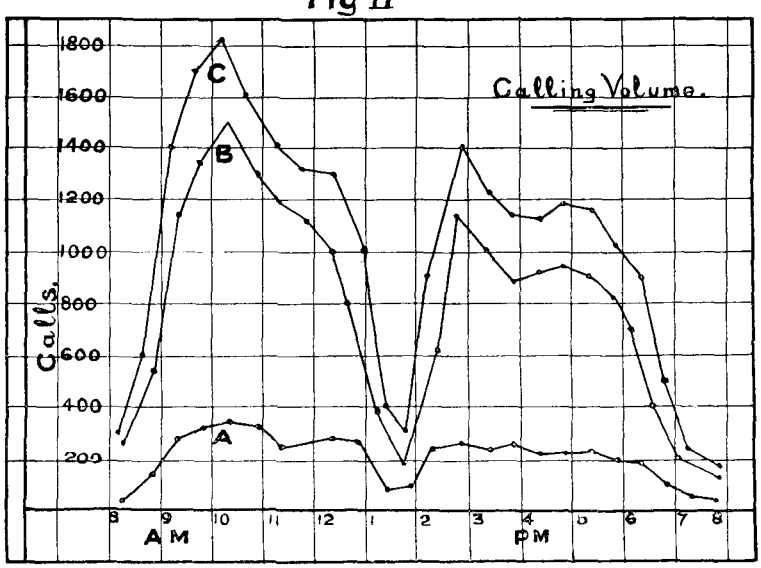


In Fig. 2, curves have been prepared showing the volume of traffic. The difference between the traffic from measured rate and flat rate services between 8 a.m. and 8 p.m. each half-hour will be seen plainly.

The curve marked A shows the measured rate calls. The distance between A B gives the extra volume of flat rate calls, and curve C represents the total volume of traffic.

The total originating calls passing on an average through this exchange when these particulars were taken was approximately 25,000 per day; out of these 2,900 only emanated from measured service subscribers, or about 11 or 12 per cent.

Fig II



The total number of working lines on the exchange when these figures were taken was, 1,027 unlimited, plus 290 party lines and 1,016 measured rate lines. The low calling rate of the measured rate subscribers will readily be seen. The traffic of measured rate stations is the more evenly distributed, as will be noticed on the curve, the subscriber using his telephone as necessity demands.

The calling rate from these subscribers averaged about 2·5 calls per line per day, against 7 to 10 per line per day for flat rate or unlimited. Tests that I made showed that the time in which an operator could answer and complete five measured rate calls, was equal to the time taken to deal with eight flat rate calls, *i.e.*, one measured rate call is equal to $\frac{8}{5}$ flat rate calls, or 1·6 flat rate calls. A very important point in the measured rate service is the ineffective traffic. These calls should be carefully watched and analysed from time to time, it being very essential from a financial point of view that they should be kept as low as possible.

A test was taken for a period of seven days to find out the percentage of ineffective calls, all the tickets being carefully sorted for that period, and out of a total of 19,851 calls, 5 per cent. were ineffective.

1st.—The service codes and marking on indicators, jacks, etc., should be properly kept up to date, so as to notify the operator exactly what facilities the subscribers are entitled to. This will tend to obviate ineffective traffic, and also help to give a rapid, accurate and efficient service.

2nd.—Quick clearance of trouble on lines and instruments is necessary, especially junction lines.

3rd.—Another point which would be advantageous is that inspectors should be instructed to destroy all old directories. I find also people will trust to memory for numbers, and of course, fail lamentably, "for the memory of them is forgotten," as Ecclesiastes has it. Numerous other instances one could record, but space will not permit.

[*Load Distribution.*—In the above extract it is noted that the effectiveness of the distribution is referred to as being judged by the number of calls per *operator*. This is not strictly correct.

As a *rough* guide to the effectiveness of the distribution, which can be readily obtained from the usual peg-count, this method may be of some use; but as a final method its logical effect would be to limit the load taken by the most junior operator to not less than 90 per cent., and that taken by the most capable operator to not more than 110 per cent. of the average. Such a limitation is impracticable.

The true basis of distribution is the load per *position*. In the case of central battery exchanges, where the lines are not definitely associated with individual positions it would even be better to compare the loads on the various panels.

Good distribution consists in even distribution of the traffic along the whole switchboard, with the exception of the end positions, which should be loaded somewhat below the average to compensate for the limitation of team work at end positions. As different records show fluctuation in the number of calls originated on each position, it is necessary to adopt some arbitrary allowable variation from the average, such as 10 per cent., to prevent frequent alterations which the next records might show to be unnecessary.

The difference in the capabilities of the operators is met by distributing the senior operators amongst the junior operators, and relying upon team work to adjust the loads taken by each operator.

The advantage of even distribution over distribution to suit the ability of individual operators lies in the fact that unavoidable changes in the staff do not introduce so much difficulty, and the service at parts of the switchboard is not impaired when operators of special ability are absent and cannot be properly replaced.—ED., "N. T. J."]

NATIONAL TELEPHONE PROGRESS.

During September 1,949 new stations were added, making a total in all of 494,802.

BIRMINGHAM.—*Victoria Exchange.*—The installation is in hand of a central battery No. 10 equipment for 420 lines, which is being installed in a new building specially designed for a telephone exchange.

CHESTER.—*Chester Exchange.*—On Sept. 4 the subscribers connected to the old magneto equipment were transferred to the new central battery No. 1 equipment for 960 lines, which has been installed in a new building specially designed for a telephone exchange.

LIVERPOOL.—*Anfield Exchange.*—The installation is in hand of a central battery No. 10 equipment for 880 lines, which is being installed in a modified building.

Bootle Exchange.—The installation is in hand of a central battery No. 1 equipment for 1,100 lines, which is being installed in a new building specially designed for a telephone exchange.

LONDON.—*Lee Green Exchange.*—The installation is in hand of a central battery No. 1 equipment for 1,300 lines in a new building specially designed for a telephone exchange.

New Cross Exchange.—On Oct. 16 the subscribers connected to the old magneto equipment were transferred to the new central battery No. 1 equipment for 1,500 lines, which has been installed in a new building specially designed for a telephone exchange.

LONDON NOTES.

THE Bromley operating staff have followed the good example recently set by Dalston. On Sept. 25 they held an "At home" in the new exchange premises, when over 40 relatives and friends of the operators were conducted over the exchange by the exchange manager and clerk-in-charge. Tea was afterwards served to the visitors. We have before commented on the good results which accrue from these gatherings, and feel sure that such an application of the searchlight of knowledge to the operating conditions of a modern telephone exchange can only be beneficial.

WE have become quite expert at recording marriages, if frequent occasion may be taken as a test of skill. It is a pleasure to report an addition of two to the long list of the year. Inspector Bale, Kensington, was the recipient of two pictures and an umbrella as a wedding gift from his colleagues, while Mr. H. Hudspeth, Cashiers' Department, Salisbury House, was presented with a marble clock. The little ceremonies associated with such occasions form a pleasant interlude in our daily routine.

Two other presentations have to be noted. It is always a delight to congratulate a member of the staff on promotion. The Southern contract staff gave their congratulations the useful form of a writing desk to Mr. A. E. Culpin on his transfer to the City. The other presentation was to Mr. W. Longfield, who has resigned his post as a City Contract Officer. His colleagues asked his acceptance of an umbrella as a parting gift.

John Bull of Sept. 18 last contained the following paragraph :—

"If the unemployed of any district in which this journal circulates should be approached by a person desirous of hiring them to re-arrange the telephone poles, and, incidentally, to dig a hole 26 feet deep, *they should take him out and screw his neck before discussing terms.* The other day such an individual hoaxed the Manchester unemployed; leaving also an unpaid bill for lodgings. Before Manchester he had been to Stockport, and prior to that he was at Sheffield. Should he materialise in London we would remind our readers that a large river runs more or less merrily through the city, and several bits of it are not always in use. *It is almost worth while risking the possibility of ducking the wrong man to get hold of the right one in a case like this.*"

The correspondent who sent us the cutting humanely suggests that local engineers and others interested ought at once to become members of the swimming club. We offer the hint gratis to the secretary. In case the suggested "neck screwing" might be tried before the ducking, our correspondent, who seems to have a lively fancy, proposes that officials concerned should have their necks suitably "stayed." He heads his comments "Prevention better than cure."

MR. JENKIN, the Dalston Exchange Manager, sent us some interesting particulars of the new Walthamstow Exchange, which, unfortunately, were just too late for last month's JOURNAL. The change-over was, of course, on a small scale as compared with some others in London, but it is gratifying that with 434 subscribers and 74 junctions, only two faults were reported, and no complaints of service interruptions were received.

MR. HARE'S paper to the telephone society on Oct. 4 was a great success. There was a large audience, which quite appreciated the many outstanding points in an able lecture. Mr. Hare divided "Control" into two sections: (1) The inner and invisible, which comprised "thought, reasoning and knowledge"; (2) the outer and visible, which included "concentration, arrangement and order." Naturally some points of difference arose in the discussion, and one or two apt illustrations by some of the speakers enlivened the proceedings. *Apropos* of some remarks on the question of how far one is expected to adhere religiously to Service Instructions, one of the wits at the meeting reduced either his own or someone else's opinion to the formula:

$$\text{Control} = \frac{\text{knowledge} \times \text{concentration}}{\text{Service Instructions}^2}.$$

We understand that a copy of Mr. Hare's paper is to be placed in the telephone society's library.

THE staff of the Croydon contract office had the pleasure of being entertained to dinner by their chief a week or two ago. Afterwards they combined business with pleasure by hearing Mr. Booth discourse on "The Musical Service," and listening on the electrophone to the music from some of the houses of entertainment.

MR. TAYLOR, Contract Manager, gave the first of the telephone society's elementary lectures on Oct. 12. The attendance was distinctly encouraging, and we hope that it is an augury of success for those to come. Mr. Taylor's subject, of course, was "Contract Work," and naturally he treated it as only one who is a master of his subject can. The next of these lectures will be by Mr. R. Bryson on "Office." The date is Nov. 9.

THE first whist drive of the season was held at "Ye Mecca," Ludgate Hill, on Oct. 13, and was successful in every way. There were 61 tables, and we hope that the benevolent fund committee, to whose exertions we owe the pleasant evening, will reap an adequate financial harvest. The prizes were all given by various friends of the fund, and were presented to the successful players by Mr. R. J. Payne, the president. One unique feature of the drive was that the number of ladies present exactly equalled the number of gentlemen. The committee, therefore, escaped the unenviable duty of asking a few ladies to "play gentlemen for once." It was a pleasure to see so large a number of Head Office staff presen

THE completed lists for the Technical and Correspondence Classes show a more widespread interest on the part of the staff than one expected a few weeks ago. In view of the unknown future, it is undoubtedly the right course for every man to increase his knowledge, and we cannot doubt that the Post Office will just be as ready as other business administrations to mark for promotion the man who knows.

THIS is the period of the year when the Clay challenge cup makes its re-appearance. We have no doubt that its custodian (who is he, by the way?) is now having it burnished ready for the annual fray which is waged around it. We hope to hear soon that there are several aspiring teams in the field.

THE chess club had its first meeting on Thursday, Oct. 7. One would have liked a larger attendance, but when the matches get into swing that result will doubtless follow.

THIS session's telephone society booklet is a very creditable production. It includes, in addition to the ordinary syllabus, the programme of the traffic branch, the whole of the society's rules, and a library catalogue which comprises a short description of each book; the whole consists of 22 pages, bound neatly in stiff paper covers. The "papers" committee are responsible for its issue, and the suggestion that a word of praise was due came from a member of that body. If our commendation is not given spontaneously, it is certainly bestowed *con amore*.

THE Bank Exchange staff announce their first whist party for the season, to be held at "Ye Mecca" Café, Ludgate Hill, on Wednesday, Nov. 10. Tickets can be obtained from Miss Reekie, who is again interesting herself in the organisation of these enjoyable evening parties. The proceeds will go to the Hospital Saturday Fund, and this of itself should be an inducement to many to purchase tickets.

THE civic ceremony at the change-over to New Cross Exchange on Saturday, Oct. 16, has excited a good deal of interest and comment amongst the staff. We entrusted a colleague with the duty of noting any special features which would make good "copy" for this column; he proved faithless, thanks to the absorbing events passing around him. We soon found others, however, eager to pass on their experiences—funny and otherwise. We tried hard to persuade one gentleman whose humorous star was in the ascendant to write an "impressionist" sketch of the proceedings, but he had a vision of "consequences," and declined. The presence of the Mayor in his official robes, and accompanied by the mace bearer, certainly added an unwonted dignity and picturesqueness to the proceedings, which were also graced by the presence of the Mayoress. The arrival of the messenger to announce that the old exchange was cut out gave quite a Marathonian flavour to the ceremony; this blending of ancient and modern may not have been intentional on the part of the authorities, but unpremeditated effects are often more successful than those rehearsed. One scoffer, whose speciality is traffic, suggested that a touch of realism would have been added had the messenger come in covered with the dust of Deptford streets and made the announcement in a panting voice. Comment is superfluous. Another man asked the writer on Monday: "Have you got over Saturday's ceremony?" I reminded him in a dignified tone that I had not been present, and charitably concluded that his forgetfulness must have been due to an attack of night-mayor. But I am still wondering why he put the question to me in that particular form.

THE traffic branch of the telephone society had a splendid opening meeting on Oct. 18, there being over 350 present. The lady chairman made a very witty opening speech, and we quite enjoyed her lively banter over some recent remarks on Suffragette tendencies which appeared in this column. Her assurance to the Engineer-in-Chief that he need not fear a stone-throwing escort on the way home, or an incursion of window breakers at Telephone House, was delightful. Mr. Gill, in his address on "Standardisation and the Operator," scored a success, as usual. We certainly envy his gift of imparting knowledge in a free and easy style. His timely word on the importance of not becoming too sectional, and of learning all we can about the work of other departments, ought to be taken to heart. We cannot attempt to summarise the lecture, but must content ourselves with one or two epigrammatic sentences:

"In the pioneer stages of a business you cannot expect to have standards."

"Incessant tinkering with a design is very expensive."

"Directly you begin to adopt standards, you begin to measure; when you begin to measure, you begin to add to your knowledge."

MANY members of the technical staff have been on pilgrimage to Earl's Court Exhibition, where an exhibit of the Automatic Electric Company of Chicago has proved a centre of attraction. The Automatic Company's manager has been most courteous in explaining the system, but has been hard pressed occasionally to find time to devote to his numerous callers. Unfortunately, the Exhibition was nearly over before the presence of the exhibit became generally known; it is to be hoped that some other opportunity may occur for the staff to gain some knowledge of a system which is practically unknown in this country. The article on "The Doomed Operator" in last month's JOURNAL has no doubt whetted curiosity on the subject. In this connection also the Engineer-in-Chief's reference at the traffic branch meeting is significant: "That much advertised thing which I don't think is coming, the automatic exchange."

ANOTHER telephone society has been formed in London. This latest recruit is in the North-Eastern district, and as the inaugural gathering at the East Exchange premises was well attended, the new venture will, no doubt, be able to command success. The opening paper will be read on Oct. 25 by Mr. O. C. Crouch, whose subject is "Voltmeter Testing." Mr. F. L. Sherburn, the hon. secretary, would like to hear from any ex-members of the North-Eastern staff who may be desirous of joining the society. There is, of course, a good deal to be said both for and against the formation of branch societies, but the conflict of opinion on the matter is so great that any expression of our personal views would probably stir up a hornet's nest. We, therefore, content ourselves with the proffer of every good wish to the North-Eastern staff. J. S.

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"BY THE STAFF FOR THE STAFF."

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VOL. IV.] NOVEMBER, 1909. [No. 44.

THE TELEPHONIC DEVELOPMENT OF THE WORLD.

WE conclude this month the series of articles dealing with statistics of the telephone system throughout the world. The result corresponds very closely with the rough estimate made in our editorial ("Telephone Statistics") of May last, although the figures or America are still largely based on estimates, the accurate returns of every one of the numerous telephone administrations in that vast continent being impossible to obtain. One outstanding effect of these figures is to show the enormous disparity between the respective developments of Europe and America. There are 2,380,800 telephones in Europe (including the figures for Russia in Asia) and about 6,870,000 in the United States alone, without including Canada or the whole of South America. The main reason for the backwardness of Europe—namely, Government development of the system—has already been enlarged on at some length in our columns; but the following remarks from a recent article in *The Times* "Engineering Supplement" are opportune:—

> "The reason for this great difference between the "development of the telephone in America and Europe is "that in America the telephone service has been brought to "a high pitch of both technical and commercial efficiency "by private enterprise, whereas in Europe it has been "practically suppressed by Government monopoly. It "cannot be seriously argued that the public of most "European countries is less desirous of availing itself of "rapid means of communication than the American public, "or is less generally 'civilised.' The business man, "whether he be British, Belgian, Dutch or French, wants "to get his business done quickly and economically. The "telephone service is the most rapid means of communica-"tion there is; it does the work of two telegrams in a "sixtieth of the time, and does it better and cheaper. If "the Austrian or the Frenchman, comparatively speaking, "does not use the telephone, it is not because he does not "want to use it, but because his Government does not allow "him to do so. His Government virtually says to him: 'I "arrogate to myself the sole right to supply you with "telephone service. It will be inefficient, slow, inaccurate "and exasperating; its supply will be surrounded by all the "arbitrary and unnecessary regulations which my officials "can devise; no improvements will be adopted except "under extreme compulsion; additional facilities will be "provided so slowly that new customers must be prepared "to wait years before securing a telephone, and long-"distance calls will take from one to seven hours to "complete. But you must take the kind of telephone "service I give you, for that is all you will get.'"

Further reference to the tables published show that, of the six European countries where the development of the telephone is passably good, Great Britain, Sweden and Denmark owe their position chiefly to the work of enterprising companies; Germany and Switzerland have always had State systems; and Norway was partially developed by a company.

When we turn to the list of cities containing 10,000 telephones and upwards we find again that North America possesses 43 out of the 76. The reason is not far to seek. The names missing from the list include such cities as Madrid, Rome, Naples, Milan, Prague, Marseilles, Lyons, Rotterdam, Antwerp, Odessa and Constantinople, many of which only boast a few thousand subscribers, and the last named (at present) none at all.

Another idea suggested by these statistics is the boundless field for telephone enterprise existing not only in distant lands, but close at hand in Europe. The man of enterprise must itch for a free hand to push aside the existing *régime* in many of the above-mentioned cities, remodel the system on modern lines, increase the subscribers from 3,000 to 10,000, and incidentally make a handsome profit for himself and his co-workers.

CORRESPONDENCE CLASSES AND PROMOTION.

WE print in another column a letter from "G. H. C." on a subject which seems to have an irresistible attraction for a large number of our correspondents, to wit, the Correspondence Classes. It is the endeavour of the Editing Committee to keep its columns open as far as possible to correspondence of all kinds and upon all subjects of interest to the staff and to other telephone men; and we have reason to believe that the Correspondence Class Committee welcomes legitimate criticisms or suggestions with regard to the papers as evidences of interest taken in their labours by the staff. The criticism of the classes on former occasions has, perhaps, been rather of the destructive than constructive order and not particularly appreciative; but as to this, of course, we have offered no comment, leaving it to the Class Committee to deal with its critics. The latter part of "G. H. C.'s" letter, however, we cannot pass over without remark.

"G. H. C." appears to be of those who regard the acquisition of knowledge as a direct means to immediate pecuniary reward. In other words, it is of no account to such students that they have enriched their minds, added to their social usefulness and improved

their mental equipment; they expect someone to come forward with an offer of tangible promotion of increase in salary forthwith. Of course it need not be said that the well-trained man and the expert look, and rightly look, for higher rewards than the man who has done nothing to raise himself above the ordinary level. But the passing of examinations and the obtaining of full marks do not necessarily qualify a man for immediate promotion; they are a step in that direction and incidentally the seeds of knowledge thus sown are an addition to the fulness of a man's mind, but they must attain a fuller development to bear fruit. No one supposes that the passing of even the highest civil service examinations with honours fits a man *ipso facto* for the governor-generalship of a colony or the management of a telephone service.

But there is another aspect to our correspondent's querulous criticism. The Correspondence Classes are provided by the Company at a considerable expense for the education of the staff in telephony in its most up-to-date practice at less than the cost of printing; but almost the only appreciation shown by "G. H. C.," and those like him, seems to consist in asking somewhat ungraciously: "What do we gain?"

We may say at once that when "G. H. C." asks what record Head Office keeps of his abilities, and what recommendation his district manager makes, and when he suggests that present methods are "of no use to him," he is trenching upon a matter quite outside his proper sphere. We can only remark that the known difficulty of filling important positions as they arise with competent men and the efforts made by the Company to afford the staff facilities for attaining this competence should be a sufficient answer to his questions.

HIC ET UBIQUE.

RECENT visitors to Telephone House were Mr. C. E. Scribner, Chief Engineer of the Western Electric Company, and Mr. T. D. Lockwood, the head of the Patent Department, American Telephone and Telegraph Company.

WE have recently had the pleasure of recording some varied successes of the staff in the world of sport, especially among the ladies. Following on the creditable display made by Miss Armstrong and Miss Bell in the Thames long-distance swim, we note this month the achievements of Miss Coward in skiff contests. Last month we recorded that the staff cricket club at Sheffield had won the championship of a local league without losing a single match.

AN ex-member of the staff in some reminiscences which we published said that at one time it was the fashion for subscribers to marry operators, but now it appeared that the staff were getting quite exclusive, and managing these things amongst themselves. This is certainly borne out by the "Marriage" column of the JOURNAL, which since its commencement has recorded upwards of 40 intermarriages of members of the staff.

AN Inverness correspondent sends us a true story of one of those individuals who pride themselves on their discernment and astuteness. A telephone set was being fitted at a subscriber's house who, upon the return of the inspector from his dinner, declined to have the instrument, insisting that it was a second-hand one. On being assured of the contrary, he pointed triumphantly to the letters H. R. (high resistance) between the gongs, whence he confidently deduced that it had already been in use in the offices of the Highland Railway.

GRANTS TO LOCAL TELEPHONE SOCIETIES IN RESPECT OF THE 1908-9 SESSION.

	£	s.	d.
Bradford	5	0	0
Blackburn	5	0	0
Bolton	5	0	0
Warrington	5	0	0
Birmingham	5	0	0
Birmingham Operators	5	0	0
Wolverhampton	5	0	0
Coventry	5	0	0
Bristol	5	0	0
Bristol Operators	5	0	0
Gloucester	5	0	0
Cheltenham	5	0	0
Cardiff	5	0	0
Swansea	5	0	0
Nottingham Factory	5	0	0
Glasgow Operators	4	18	0
Truro	4	19	6
Hastings	4	19	0
Nottingham	4	18	0
Liverpool and Birkenhead	4	15	6
Cardiff Operators	4	13	6
Hanley	4	13	0
Swansea Operators	4	12	6
Isle of Man	4	11	6
Newcastle	4	11	0
Chester	4	10	6
Sheffield	4	10	0
Luton	4	10	0
Tunbridge Wells	4	7	0
Plymouth	4	7	0
London (Southern)	4	6	6
Portsmouth	4	5	0
Leeds	4	4	6
Dublin	4	3	0
Glasgow	4	2	6
Greenock	4	1	6
London (Western)	4	0	0
Dover	3	18	7
Leicester	3	17	6
London	3	15	6
Sunderland	3	15	0
Oldham	3	14	6
Brighton	3	14	6
Manchester	3	13	0
Bradford	3	10	6
Cork	3	2	0

THE TELEPHONE MASONIC LODGE.

AT the regular meeting of the lodge which took place in the Masonic Temple of the Gaiety Restaurant on Oct. 16, W. Bro. P. P. Kipping occupied the chair and was supported by the following officers:—W. Bro. F. O. Harke, L R., I.P.M.; Bros., S. J. Goddard, S.W.; F. A. B. Lord, J.W.; A. F. Paddon, S.D.; W. M. France, J.D.; J. E. Pullin, I.G.; C. E. Tattersall, treas.; P. Kenny, secy.; W. J. Downes, assist. D.C.; V. Baldwin, orgst.; F. E. Sims and R. H. Kenway, stewards; and a large number of members and visitors. Bros. J. T. Tattersall, P. W. Bacon, C. F. Street, H. M. Darville, H. M. Pease, R. B. Bumiller and E. W. Newton were advanced a stage; and Messrs. A. L. de Lattre, T. E. Devonshire and F. Addey, all of the P.O. Engineering Staff, were initiated. On the motion of Bro. R. J. Payne it was decided to take the necessary steps for the formation of a Lodge of Instruction, after consideration by the general purposes committee of the lodge. Bro. Kipping, W.M, was appointed a steward to represent the lodge at the next festival of the Royal Masonic Institution for Girls.

Amongst the guests who afterwards dined with the members of the lodge were W. Bro. John F. Roberts, P.G. Std. Br.; W. Bro. E. C. Mulvey, P.G.P.; R. W. Bro. W. J. Jack, S.W., District Grand Lodge of Hong Kong and South China; W. Bro. H. E. Langridge, P.A.G.S., Bucks; W. Bros. Thos. Fletcher, P.M.; G. W. Perry, P.M.; Bros. D. H. Nye, Buenos Ayres; W. Noble, 54, St. Martin's Lodge; and F. E. Bennet, Adelphi.

REPEATING COILS.*

BY G. H. BRYANT, *Metropolitan Electrician's Department.*

REPEATING coils are practically transformers; and in most cases have a ratio of transformation of one to one, for the number of turns in the windings are generally equal. Their purpose in central battery circuits is to divide them into two sections so that rapidly fluctuating and alternating currents will be repeated from one section of the circuit to the other, while continuous currents which operate the supervisory and other relays will be confined to the one section, see *Fig.* 1.

Also it should be remembered that as receivers respond more efficiently to alternating than to fluctuating currents, and, as the repeater (*i.e.*, transformer) will give out an alternating current on the listening side no matter whether the current in the speaking side is fluctuating or alternating, the repeater serves a very useful purpose in always passing an alternating current to the receiving instrument.

I believe the earliest form of repeating coil was the translator, which was used for connecting earth circuits to metallic circuits; and also for obtaining a third circuit from two metallic circuits. The arrangement is shown in Fig. 2, and the extra circuit thus formed is known as a superimposed or phantom circuit.

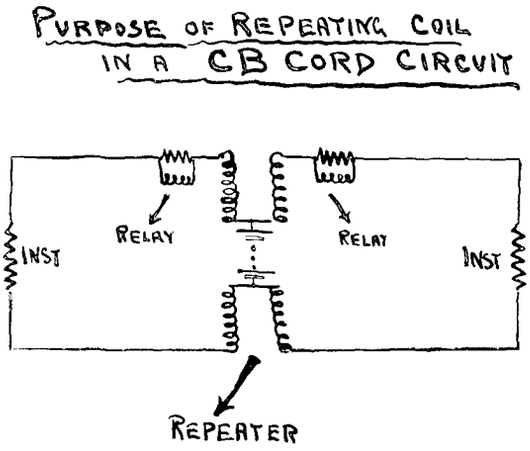


FIG. 1.

As these translators have a good iron circuit, practically a closed one, it is possible to ring through them effectively; this is a point to bear in mind when inserting repeaters in circuits working with generator signalling. I have a recollection that No. 11 type repeating coils were fitted in the incoming order wires at a number of magneto exchanges, and had to be removed owing to difficulty experienced with the signalling.

Most central battery cord circuits are equipped with a repeater, but it is not essential, as is shown by the Kellogg and Ericsson "A" cord circuits, which are provided with condensers and retardation coils (relays with a good iron circuit) in lieu. The Kellogg junction circuits, however, are fitted with repeating coils. These are of interest owing to their small bulk as compared with most other types.

The repeaters fitted at the Company's London central battery exchanges (nineteen working and two under construction) are the Nos. 11, 12, 13 and 25*a*.

Nos. 11, 12 and 13 repeaters are identical in outward appearance and are all spoken of as the No. 11 type. The No. 25*a* or toroidal coil is altogether different in design and is being fitted in both the "A" and "B" cord circuits at all new exchanges.

The first London central battery exchanges were fitted with the No 13 repeating coils, which pattern is peculiar inasmuch as it is only possible to connect it up one way if all the windings are to be operative and so that the core shall always be magnetised during conversation.

The No. 11 repeater is intended for "A" positions only, and is so arranged that when connecting subscribers' circuits of equal resistance the core is not magnetised during conversation; when in this condition the coil is reckoned to be most efficient, but is liable

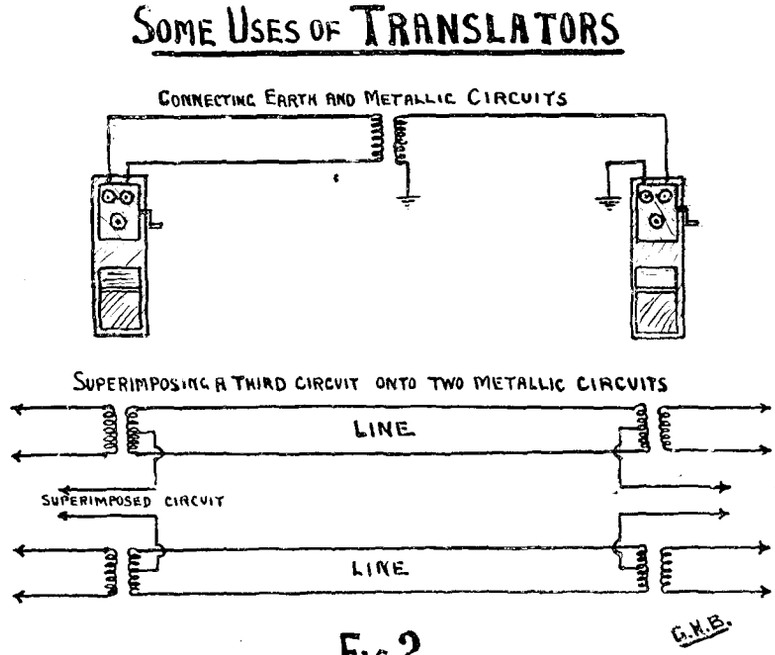


FIG. 2.

to pass battery noises and cross talk through to the lines unless the internal resistance of the battery is low and very short main battery leads are used. For the latter reason the No. 13 coil had to be used at an Exchange, where the fuse-boards are located six floors away from the battery.

The No. 12 repeater is used on "B" positions, and can be connected so that there is a tendency for the core to be either magnetised or not magnetised during conversation. This question

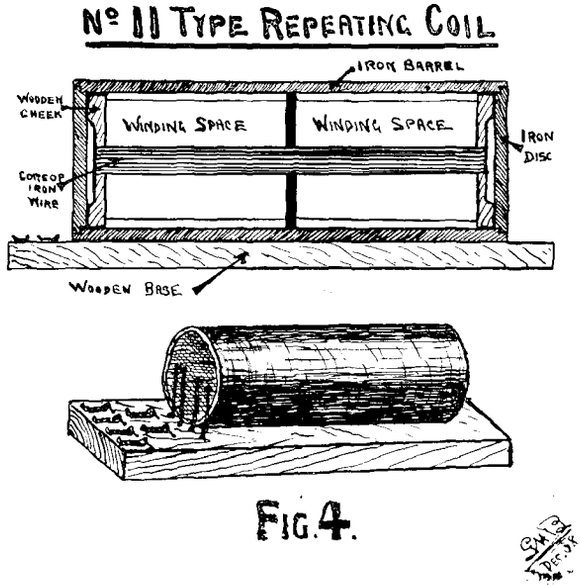


FIG. 4.

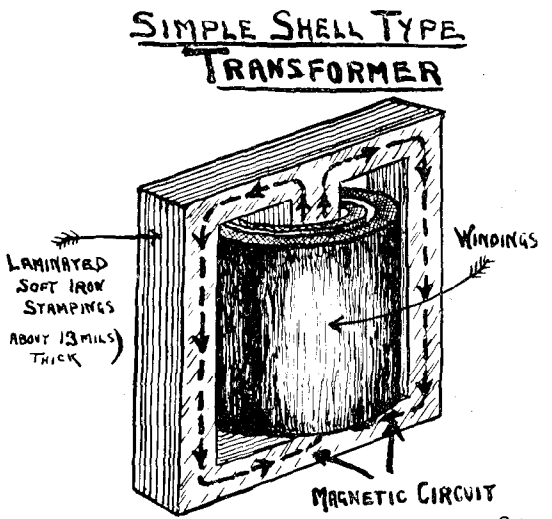
of the core being magnetised or not should not be confused with the so-called consequent pole effect. The latter is a necessary arrangement for working incoming lines from magneto exchanges so that the induced current does not affect the ring-off indicator at the magneto exchange when the central battery subscriber lifts his receiver off the switch-hook.

Nos. 11, 12 and 13 repeating coils are all constructed on the lines of the coil shown in Fig. 4. We will consider the magnetic

* Extract from a paper read before the Southern and Western London Telephone Societies, session 1908-9, on "Induction Coils, Repeaters and Transformers."

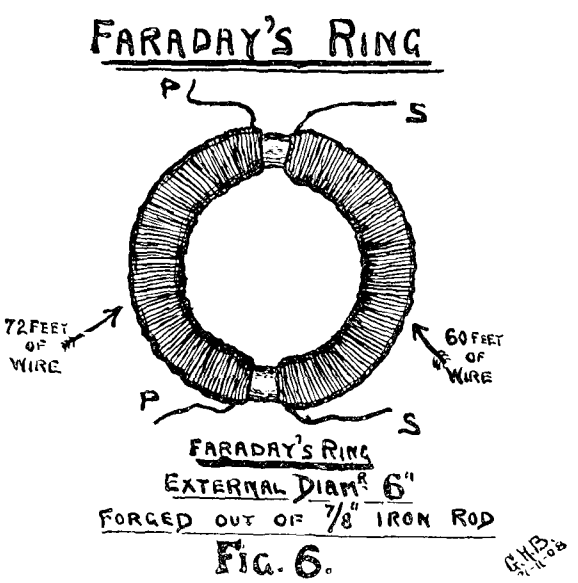
circuit, *i.e.*, the path for the lines of force. This type of repeater can be spoken of as a shell transformer. The next sketch, Fig. 5, illustrates a shell transformer; the two windings, primary and secondary, are shown, and completely enveloping them in the form of a shell is the iron circuit. The flux, *i.e.*, the lines of force, after passing through the centre windings has a divided path, and unites again at the bottom as shown by the arrows.

Referring again to Fig. 4, it will be seen that the iron circuit of this type of repeater is very similar to that of the shell transformer.



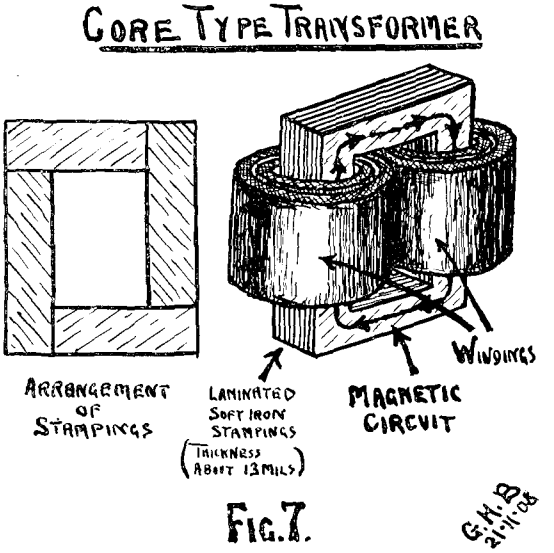
The core does not touch the end pieces, however, but is separated by a piece of cardboard; this gap is necessary in order that the coil shall be an efficient speaker—if I may so express it. When a repeating coil of this pattern is required to be rung through the iron wires forming the core are continued over the bobbin ends, and finish off after the style of the translator; the Company, so far as I know, do not use this type.

Repeaters Nos. 11 and 12 have four windings, two in each half section, see Figs. 4 and 12; the two windings in one section are



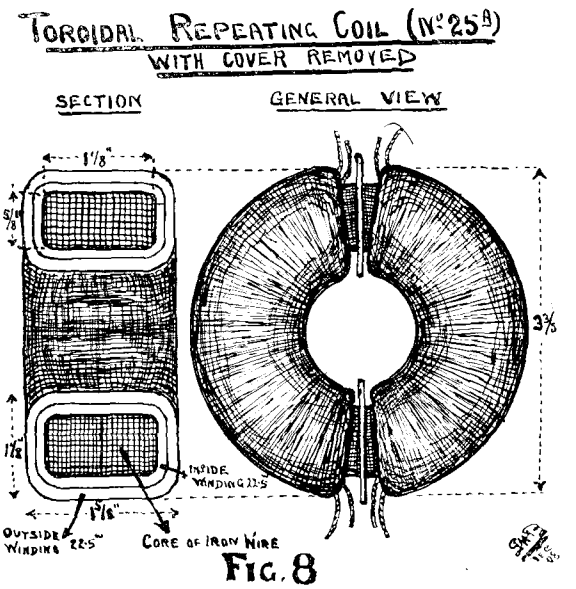
connected with the "A" lines of the circuits, and the two in the other section with the "B" lines. Considering one-half section of the coil, the windings are not wound one above the other as might be supposed, but lie side by side throughout the layers of the coil. The resistance of the windings on a No. 11 coil is 42 ohms each, but of those on a No. 12 coil is 21 ohms.

The No. 13 repeater differs from Nos. 11 and 12 inasmuch as each of the four arms are practically wound the length of the core, instead of covering only one-half. See Fig. 12. Owing to there being eight windings, four in each section, and each arm of the repeater having a winding in each section arranged in series, the connections must be such that the core is magnetised during conversation, for if they were otherwise connected the net result of the inductive effects between the windings would be *nil*. This will be readily seen if four windings wound the length of a core are sketched out, and the various methods of joining up considered.



In the case of repeaters Nos. 11, 12 and 13 some of the terminals are mounted at the back and some at the front of the coil in the "A" pattern, but all are at one end in the "B" pattern. The latter type can therefore be fitted against a wall.

The internal arrangement of the latest type of repeater, namely, the toroidal or 25*a* is shown in Fig. 8. Two coils are mounted on one base and take up the same space as a pair of No. 11 coils, so that the latter could be changed if necessary for the

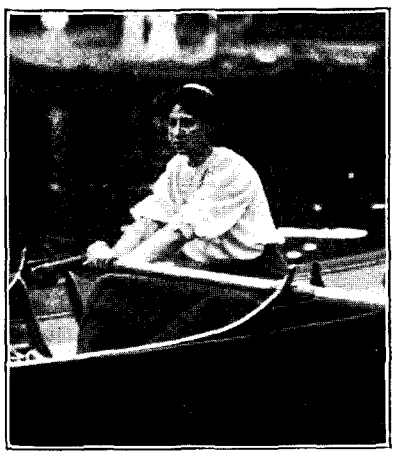


former without any alteration in the racks. This repeater can be considered as a core type transformer, see Fig. 7, where it will be noticed that the iron circuit is arranged in the form of a core, hence the name. The path of the flux is shown by the dotted line. The iron circuit of this type of repeater is very similar to that of the core transformer; it also bears a marked resemblance to Faraday's ring, so called because with its aid Faraday discovered magneto-electric induction in the year 1831. Faraday's ring is shown in Fig. 6.

(To be concluded.)

Miss MARIE COWARD, Clerk-in-Charge, Wimbledon, has accomplished some feats in the athletic world, which are not unworthy of notice. The photograph was taken after she had won the ladies' single sculls at Kingston-on-Thames at the Skiff Club's Regatta, 1908.

Miss Coward first started racing in 1905, since when she has won sixteen first prizes. Amongst a long list of events, those which proved the most exciting



MISS MARIE COWARD.

were Maidenhead in 1906, when she won by two feet; Bourne End, 1907, won by one length; Kingston, 1908, won by one foot after a dead heat. The greatest race, however, which she ever entered for was in 1908. The crew in which she was rowing No. 3 won the ladies' fours at Henley, beating the then unbeaten Reading ladies' four by half a length—a very popular win.

Miss Coward lost the English ladies' championship at Teddington in August this year by one foot after a very hard race.

SOME LONG SERVICE MEN.

MR. W. K. WOOD.

Mr. W. K. WOOD, the Assistant Chief Electrician in the Liverpool district, who joined the Company in August, 1879, has now completed 30 years' service.

He commenced as an office boy, afterwards working for a short while as operator, and has been engaged during the whole of his subsequent career on electrical work. After some experience of instrument faults and the fitting of instruments, he worked on the switchboard at the Central Exchange, which was the first multiple board to be fitted in Europe. On completion of this work he was appointed Exchange Inspector at Central Exchange, where he was subsequently appointed Test Clerk.

He was one of the first members of the Company's staff to speak through the first trunk line opened in the country, viz., between Liverpool and Manchester. It might interest readers of the JOURNAL to know that the route was erected along the Cheshire Lines Railway, the line being worked as single circuit, and in the first conversations that took place the railway metal was used as the "earth."

From Test Clerk Mr. Wood was transferred to take charge of the major portion of the exchange construction work in the Liverpool district. In 1907 he was promoted to the position of Assistant Chief Electrician of the Liverpool district, in which capacity he is still working, and has charge, under the Chief Electrician, of the Company's work in connection with central battery exchanges in the Liverpool district, both completed and in the course of construction.

Mr. Wood has always taken a very great interest in matters connected with telephone societies, and has been a member of committee for the Liverpool Society since its inauguration in 1887, and has assisted in a very practical way, both in his contributions in the form of lectures and the preparation of lantern slides, etc., for other members. He is a telephone enthusiast in the best sense of the word, and his quick insight into difficulties, coupled with his very practical willingness to help others out of them, has made him justly popular amongst all members of the Liverpool staff.

MR. ARTHUR EDGAR COTTERELL, the Assistant Provincial Superintendent of the Southern Province, a photograph and biographical sketch of whom appeared in July (1908) issue of the JOURNAL, will have completed 30 years in the telephone service on Nov. 11, having joined the service in Birmingham in 1879, prior to the opening of the first telephone exchange there. That being the year in which the earliest exchanges were started in the country (London excepted in 1878) it will be seen that (notwithstanding a short break in his service from October, 1884 to April, 1886, during the greater part of which he continued, however, in close touch with telephone matters) he is one of the few officers of the Company who is able to claim some personal recollections of the inauguration and development of our present huge system. Mr. Cotterell is proposing to recall some of his reminiscences in an address before the Dover Telephone Society on Nov. 9.

Mr. SHELDON CRADOCK, the Metropolitan Night Manager, has now completed nearly 28 years of telephone service, having joined the Lancashire and Cheshire Company in 1884. He was transferred to London in 1884, and

MR. SHELDON CRADOCK.

became an engineer in the old Eastern district in January, 1897, was a Local Manager in the Southern district of London in 1898 and appointed Night Service Inspector in 1901. The first of the accompanying photographs was taken after a ride from Liverpool to Leamington 40 years ago, and the latter was taken in July last, after a journey from Buckingham to the same town. On this occasion, Mr. Cradock took the opportunity of visiting the same photographer, who was able to turn up the negative of the early picture.

Mr. ARTHUR T. WALLER, one of the Senior Cashiers at Salisbury House, completed his 30 years' service with the Company on Oct. 20. He entered the service with the Telephone Company, Limited, in 1879, Mr. J. B. Saunders being then General Manager, and W. H. Morris, Secretary. He has interested himself on behalf of the staff in several ways. He was first secretary to the London Benevolent Society; he is still serving on the local committee of the Staff Transfer Association; and the instalment system of season tickets for the staff, now in force in London, was first suggested to the Chief Accountant by Mr. Waller.

MR. ARTHUR T. WALLER.

OPERATING IN RURAL WISCONSIN.

How would you like, says a Chicago contemporary, to sit at a telephone board and say "Oconomowoc" several hundred times each day? That's the duty of the three young women who operate the exchange in the fashionable summer resort for Chicagoans. Here are other Wisconsin towns, repeating the cognomens of which limbers up the vocal cords of the "hello girls": Kickapoo, Ixonia, Menekaunee, Wyocena, Kaukauna, Menomonee Falls, Mukwanago, Namekagon, Wauwotosa, Wauzeka, Weyauwega. Last, but not least, there is an appellation hardly Indian which appals more than any of the rest. It is Schlesingerville.

With all of which we unreservedly agree.

THE DEATH OF TWO LOCAL DIRECTORS.

WE regret to announce the death of Mr. Alderman Joseph Thompson, of Manchester, a member of the Board until 1897, since when he was a director of the Local Lancashire and Cheshire board. Mr. Thompson, who was born in 1833, had been a member of the Manchester City Council since 1865, being appointed alderman in 1879; and he had served the city so long that he enjoyed the distinction of being the "Father" of the Council. He devoted a great deal of his time to philanthropic and educational work and to public activities of all descriptions, and was a well-known figure in Manchester. He was a member of the board of the old Lancashire and Cheshire Company and a Director of the National Telephone Company from the amalgamation until 1897.

WE also regret to record the death, at the age of 83, of Mr. Thomas Hill, J.P. of Nottingham, the Company's local Director for Nottingham. He was a prominent member of a well-known Nottingham firm, and took at one time an active part in the public affairs in that city.

TECHNICAL COLLEGE, GLASGOW, EVENING CLASSES, 1908-9.

Roll of Honour (Clerical Department).

Name.	Class.	Percentage of marks.	Remarks.
*Stark, A. B. ..	Magnetic and electrical I (laboratory) ..	78	Creditable result in mathematics II.
†Paton, James ..	Mathematics I..	95	Second prize. Also creditable result in shorthand.
†Millar, George..	Telephony I	87	Creditable result in electrical engineering II.
Muir, D. ..	Mathematics I	86	
Thomson, A. C.	Electrical engineering I ..	83	Creditable results in bookkeeping and arithmetic.
Reid, James ..	Telephony I	78	
Walker, Andrew	Magnetic and electrical I (laboratory)	75	Creditable result in lectures.

Board Schools (including 90 per cent. and over).

*Collie, Miss ..	Shorthand III..	100	Creditable result in typewriting.
,, ,, ..	Bookkeeping III	94·6	
†Murray, John ..	Bookkeeping III	95·3	Creditable result in magnetic and electrical.
Hay, John ..	Bookkeeping (advertisement)..	93	
Rennie, Wm. ..	Mathematics II (including arithmetic)	100	First prize winner.
Chambers, A. ..	Mathematics II	97	First prize winner.
,, ..	Arithmetic II	91·5	
Milne, R. ..	Mathematics II (including arithmetic)	96	
Brims, James ..	Mathematics II	96	Creditable result in arithmetic.
Boyd, R. ..	Magnetic and electrical ..	94·5	
Cullen, James ..	Arithmetic II	90	

Those marked * appeared on last year's roll.
,, ,, † ,, ,, rolls for last two years.

HANGING UP THE RECEIVER.

"No," drawled the mayor of the far Western settlement, "the boys had some money tied up in that thar bankrupt telephone company an' they just didn't like the way the receiver was handling the business."

"Didn't, eh?" commented the tourist, "Well what did they do about it?"

"Oh, they just hung up the receiver."—*Chicago News.*

THE NATIONAL TELEPHONE STAFF BENEVOLENT SOCIETY, LONDON.

The following grants were made during September:—

Engineers' Department (three)	£6	5	0
Contract Department (one)	4	0	0
Maintenance Department (two)	6	16	1
Traffic Department (one)	2	0	0

Number of grants made since formation of society—205, value £620 17*s.* 7*d.*
Donation received amounted to £6 18*s.* 10*d.*
Number of members at Sept. 30, 2,786.

CORRESPONDENCE.

THE MONITORS' TABLE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

WITH reference to the article by Mr. Hincks in this month's issue of the JOURNAL, may I be allowed to point out the disadvantages of the method of operators giving in details of complaints to the monitors before the subscriber is connected.

(1) It necessitates the subscriber waiting after he has asked for the clerk-in-charge, while the operator is making her explanation, which delay, if the caller is in an impatient frame of mind, does not tend to make him more reasonable.

(2) This method hinders an operator if she is busy, and as a result she gives in a breathless flurried account of the trouble to the monitor, who cannot grasp what is said before the subscriber is switched on.

(3) The information given by the operator to the monitor is practically valueless. For instance, a subscriber is complaining "Cut off three times," etc. The monitor cannot immediately explain the difficulty away on the operator's statement. If she does, the subscriber will invariably accuse her of "hearing the operator's side first."

(4) A subscriber is much better pacified if he is advised his complaint shall receive thorough investigation and he shall be given an explanation shortly.

This enables the monitor to pass the docket to the divisional supervisor, who questions the monitor at a favourable opportunity, and, when the docket is returned to the table, the monitor is then able to frame her answer to the subscriber.

(5) Why should a monitor listen to the details and explanation of a complaint as given by the operator, when the same ground is covered by the divisional supervisor's remarks?

May I be allowed to state that I think it fairer on all sides to listen to the complainant's side of the question first, so that the monitor may judge more fairly the true value of the complaint. An operator is not condemned on any statement made by a subscriber until she has been allowed a fair opportunity to make her explanation good.

I have known cases when an operator (thinking a subscriber is making a complaint of her work) has offered a monitor a lengthy explanation about "numbers engaged," etc., and when the subscriber is connected it has been found that he is only wanting a telephone number looked up.

With many apologies for the length of this letter.

Battersea Park, London, S.W. EVELYN MARSHALL.

THE EDUCATION OF THE PUBLIC.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

IN the education of the new subscriber Mrs. Distin suggests that the clerk-in-charge "should enter into common difficulties" and "explain the regulation expressions," as "information *has* to be given sooner or later.' This method may answer well enough for small exchanges, but when the number of new subscribers connected daily rises to a fairly high figure the amount of time spent in repeating these verbal instructions and explanations would be very great.

Perhaps the process of education might be made easier by supplying the subscriber with a few simple operating instructions, printed in the form of a small booklet, just as the Company supplies a small booklet of service instructions to the operators.

This would save the time spent in the incessant repetition of the same rules and would leave the clerk-in-charge free to give any further assistance to the subscriber which might be necessary.

By the use of the printed instructions the subscriber could make himself familiar with the operating expressions and their meaning before the telephone was completed.

When the telephone had been connected the subscriber could use the service at once, if necessary—an advantage to the Company as well as to the subscriber.

Perhaps a small booklet of this kind would also prove useful to many users of the public call office, who frequently find difficulty in understanding the operation of the call office apparatus.

Glasgow, Oct. 4. T. BELL (Exchange Inspector).

TRANSFER OF SURPLUS STOCK.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

REGARDING the article on the above in the October JOURNAL, it is not stated if the system therein suggested has been put to actual test, with the result that without this one must fall back on comparison. In so doing, it is impossible to rise to the same enthusiastic height of praise as the author. It presents nothing more efficient, or economical, than is at present in force. With some experience, may I be allowed to probe a little into the advantages claimed?

"*Uniform Record*"—Surely the lists and Schedules 1124 and 1134 now in use are such? The lists are called for annually by Head Office at such a time as to cause each centre to go carefully through its stock half-way through the stores year. Each storekeeper makes and retains carbon copies. To give Head Office the aggregate and sequence for the whole of the district, these are copied in the district office, with carbon duplicates for own use. The lists contain a good proportion of items notified for transfer each year, are easy of reference and give width for all deductions and additions. No copying of Schedules 1124 and 1134 need take place. The storekeeper makes out and initials the office notes and signs and passes on to Head Office. It would be an advantage if these forms were supplied in triplicate.

"*Minimum Labour.*"—If time is saved in the direction indicated, it will be needed in another, *e.g.*, should several centres have quantities of same class of material to transfer, separate forms will be required for each, with consequent looking through, aggregating, deducting, filling in particulars, and so on.

Little Time is Involved in Altering Lists.—Only the figures need amendment. When no quantity remains the description can be left for further use if required. It is not necessary to show on lists places to where goods have been sent. If the information is wanted for any purpose it can be obtained from order to despatch or copy of Schedule 1124.

"*Saving of Time and Trouble by only Recording Actual Stock.*"—No one need be troubled or worried by a hypothetical stock.

"*Complete Adaptability to Extension.*"—So much so as likely to get lost in infinitude. Take a probable case. B and C centres have 25 and 30 bolts arming, S.L. 1, for transfer. During the month A centre requires twenty, supplied by C. In the distributor for this class of material there will then be two Schedules 1134 and one Schedule 1124. Nothing further transpires for a month or two, then A by recovery has 200 available. Another Schedule 1134 is added, followed by several Schedules 1124, as distribution is made by Head Office. As each form is added, the exact position is made more complex. If this is the case in the district office what will it amount to at Head Office in the keeping of separate forms for *each* centre?

There will be an increase in cost. A distributor and cards will be required at each centre. If the subdivision of stores, tools and sales is maintained, with separate forms for each item, it is doubtful if one distributor will suffice in the district office. Then one form, one item, will cause a greater run on these stationery articles, a larger amount of time spent filling in particulars.

Leeds, Oct. 7. G. H. SARGEANT.

FUSES.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I NOTICE that at the various telephone exchanges the electric light installations are invariably protected against damage from excessive rushes of current by the use of lead fuses ranging from 1 to 60 amperes. I should be glad if someone would state the reason why lead is employed when it seems to me incontestable that copper is superior for the purpose.

Bradford, Oct. 1. SHORT CIRCUIT.

CORRESPONDENCE CLASSES.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

REFERRING to Mr. Rumley's letter in the October issue, one cannot help but smile at the first sentence, and then turn over the next page and see Mr. Sutherland's photo, together with a short paragraph of his achievements. Of course, all honour where honour is due, although I cannot but think that the man who has done his one or two courses and gained his certificates will feel quite as proud himself, especially if that man has done something *outside his own department.*

I think Mr. Rumley has made a mistake in asking that the elementary principles be eliminated, and also in asking that the classes should be split up into departments.

From my own knowledge gained from these classes, I would say that they were primarily designed to meet the needs of those unfortunate employees situated in small places where no technical classes are held. He must remember that a goodly number are not so fortunate as ourselves, and any outside knowledge we can obtain ought to be to our advantage, and that we should make the most of it.

Again, to be a successful telephone man one must know his own work thoroughly and also something of someone else's in order that, should an opportunity arise, he could fill a new and different position creditably. It would be a mistake to split the classes into departments as it would create a tendency to study just one's own work and ignore the other departments. The result of such training can be imagined.

Therefore I consider that the books have been well mapped out in order that knowledge of the whole telephone industry may be obtained. Of course they may be terse in places, but they are quite good enough to give a man who thinks anything of his work a craving for more knowledge.

Mr. Rumley strikes a splendid chord in the last point of his letter and one which I cannot let slip without following up. What advantages do we gain from such classes? I often wonder when a man has done his full course whether Head Office ever take the trouble to enquire what this man can do, what are his abilities, his length of service, and what the district manager has to say on the matter generally and his recommendations, if any? Does Head Office keep a record of any of our work done in these classes? If so, for what intention? No doubt most districts have a system of endorsing on a man's staff card the results of his examinations, etc., which possibly come before the district manager once a year and are then put back and forgotten, but such a system is of no use to us. Again, is there ever any benefit shown to a man, who is entirely outside the practical line, having passed the classes successfully and in addition studied and perhaps passed one or two technical classes? I must confess I know of none, and yet for such men, with a thorough business training and a good sound theoretical knowledge, there ought to be a wide field for promotion in the telephone industry. I know such men are in demand in the electrical world, and if the Company do not look after them, who can blame them for departing hence? G. H. C.

Nottingham, Oct. 5.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

PERHAPS Mr. Rumley, after his letter of (should I say "scathing") criticism on the method adopted in controlling the Correspondence Courses, will be reconciled when he has read the excellent article on the classes by Mr. L. J. Farries in last month's JOURNAL, which shows that the work and organisation is no easy matter.

I quite agree with the first part of his letter, that the method of commendation might be altered with advantage, say those securing the highest marks in Stage I to include Courses "M," "A," "B." Stage II to include "N," "C," "D" Courses. With regard to the books being more practical, technical and complete, I consider very little fault can be found with them.

He mentions that they are made up of "Service Instructions" and "Engineering Circulars," which should be free and common knowledge to all, but the point is—is this so? The "fine idea" of a former correspondent with which Mr. Rumley agrees, *i.e.*, having separate books on the work he mentions, is absurd, as if he looks through the books, he will find these items are included and in interesting form also.

In another point I fail to see what Mr. Rumley means by "studying a lot of stuff you do not require." Certainly it is essential to know one's own work, but if one is to make headway, it is imperative to get a good insight into other people's, and the way open to one is the Correspondence Courses; this is one of the many advantages derived from them. Another point in question is, "What encouragement have the staff to take up the courses?" Generally before buying an article, you enquire as to the cost; and the price of the Company's courses, especially when no postage is incurred, is a great encouragement, including as they do much valuable information at a minimum cost!

What does Mr. Rumley require for his outlay?

Leicester. P. V. SANSOME.

THE "DOOMED" OPERATORS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

YOUR optimistic leading article in the last number of the JOURNAL was no doubt consoling to that section of the staff which it was primarily intended to interest, but I venture to think that had the writer examined the exhibit of an automatic telephone exchange which was on view at the Earl's Court Exhibition during the past season his remarks would have been considerably modified. As an interested visitor I manipulated the various instruments on view and cannot agree with the opinion expressed that a fundamental difficulty exists in the public operating the instruments. As a matter of fact the operation is extremely simple, and to imagine that the public would find any difficulty is to credit it with very little common sense indeed. With regard to the other points raised, viz., heavy initial expense, cost of maintenance and complications with large systems, having no figures or statistics of any kind I am not in a position to criticise these, but I was informed by the demonstrator, and I give it for what it is worth, that up to 14,000 lines the cost of an automatic exchange is greater than a manual exchange, at which number the cost is the same, but it was carefully emphasized that the operators' wages, rents, cost of heating, lighting, etc., were conspicuous by their absence. All this I know is somewhat vague, and because it is and in view of the interest which the exhibit referred to excited, I beg to suggest that either an article or a correspondence on the subject of automatic telephony would prove of interest to your readers.

London, Oct. 19. A. WRIGHT, Maintenance Electrician.

IMPEDANCE OF TELEPHONIC APPARATUS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL

THERE are one or two points in connection with the table given by Mr. Cohen in his interesting paper on the above that are not quite clear to me. For instance, the 1,000-ohm tubular indicator S.L. 10 is shown to have an effective resistance of 8,000 ohms, while the effective resistance of S.L. 11 is two and a half times as great.

In the case of local battery subscribers' instruments the effective resistance with the key depressed is higher than with it not depressed. This appears to me on the surface to be the reverse to what one would expect, owing to the increased self-induction of the secondary of the induction coil when the primary is disconnected.

No doubt the explanation of these apparent anomalies is a very simple one. Perhaps Mr. Cohen will be good enough to make them clear.

Bournemouth, Sept. 22. E. HARPER, Local Manager.

[Mr. Harper will find the explanation for the increase in effective resistance in the case of the differentially wound indicator in the third paragraph from the end of my article. It is stated in this paragraph that the effect is due to the mutual capacity between the two windings, and it may be mentioned that the condenser formed by the two windings has a very considerable dielectric loss, which appears as effective resistance in the measurements. With regard to the increase in effective resistance of a local battery subscriber's instrument, this effect is due to the induction coil, and merely indicates the greater transformation loss when the load comes on.—B. S. C.]

POLE ERECTION, LEICESTER.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

REFERRING to the article on "Pole Erection in Leicester" in the September JOURNAL, it would be interesting if Mr. Garrard would give a ground plan of the scene of operations showing the distance apart of the three derricks, as it would appear from the photographs that if the second derrick had been placed near the pole hole the third derrick could have been dispensed with.

In Fig. 4 the tackle apparently goes from the head of the second derrick to the balance of the pole being erected, which I should consider to be rather a long "fleet." Perhaps Mr. Garrard will also mention the number of men who were employed on this erection. (Foreman) J. A. LEE.

Brixton, Oct. 18.

DINING ROOM.

THE OPERATORS' QUARTERS IN THE MIDLAND EXCHANGE, BIRMINGHAM.

IN the January and February numbers of the JOURNAL appeared a description of the new Midland Exchange, Birmingham. The photographs which appear on this page show those portions of the building devoted more particularly to the training and comfort of the operators, and may be of interest to our readers as fairly typical of the arrangements obtaining in the larger exchanges of the Company. A fully equipped operating school is not, of course, a feature of every large exchange; they exist only in the great centres of population, the operators in other places receiving their training in the exchange before being assigned a position at the switchboard. Some idea of the process of selecting and training operators for the Glasgow and London schools were given in articles in the October and December numbers of the year 1906, while a full description of the course of training received in the London school was given in the February and March (1907) numbers in the article entitled "The Telephone Operator at School."

SITTING ROOM.

OPERATING SCHOOL.

EXAMINATION SUCCESSES.

Hanley.—City and Guilds: J. Frost, second-class pass honours, telephony. R. E. Deakin, second-class pass ordinary, telephony: W. D. Edwards, second-class pass ordinary, telephony. Other examinations: R. E. Deakin, second-class pass, stage 2, electricity and magnetism; F. Gresswell, first-class pass, stage 1, practical chemistry; F. Gresswell, first-class pass, stage 1, theoretical chemistry. The two members, R. E. Deakin and W. D. Edwards were also the recipients of prizes valued at 5s. each for the best competition short papers read at the telephone societies' meeting for the session 1908-9.

Wolverhampton.—R. J. Stanley and H. Kendrick, of Walsall, passed the Board of Education Examination in respect of magnetism and electricity, stage 1.

Cardiff.—G. D. Bateman (district office), theoretical mathematics, stage 1, first-class certificates, Board of Education, London, and Technical School, Cardiff: also practical mathematics, stage 2, first-class certificate, Technical School, Cardiff. A. Fradd (district office), theoretical mathematics, stage 1, first-class certificate, Cardiff Technical School, and theoretical mathematics, stage 1, second-class certificate, Board of Education, London.

Burnley.—The following successes have been obtained in connection with the Technical School Classes, session 1908-9:—Tom Hargreaves, inspector, first-class pass practical mathematics, Board of Education; second-class pass, first stage, mathematics, Board of Education; second-class pass, ordinary grade, telephony, City and Guilds. Herbert Adams, inspector, first-class pass, first stage, mathematics, Board of Education; second-class pass, practical mathematics, Board of Education; second-class pass, elementary magnetism and electricity, Board of Education. G. E. Mitchell, inspector, second-class pass, first stage, mathematics, Board of Education. A. Hargreaves, junior clerk, second-class pass, first stage, mathematics, Board of Education.

Sheffield.—The following examinations have been passed by members of the Sheffield staff, session 1908-9:—City and Guilds: J. W. Wright, B. Hart, T. Smith, A. H. Grindrod, second-class telephony, ordinary; J. Hyde, second-class telephony, honours. Sheffield University: J. W. Wright, first-class electrical engineering, lectures; first-class and prize electrical engineering, laboratory: second-class telephony, honours; W. T. Woodhouse and H. C. Richardson, second-class telephony, ordinary; T. Smith, second-class telephony honours; first-class mathematics, stage 1. Board of Education: T. Smith, second-class mathematics, stage 1.

THE IMPEDANCE OF TELEPHONIC APPARATUS.

IN the table on page 113 the inductance of receiver double pole bell (60ω central battery) is given as ·182 henry. This should be ·0182 henry.

NEWS OF THE STAFF.

MR. F. G. C. BALDWIN, on the occasion of leaving Birmingham to take up his duties as Assistant Engineer at London, was presented by his staff with a handsome picture on Sept. 24. The presentation was made by Mr. Williamson, the District Manager.

Miss FLORRIE GLADMAN, one of the Senior Operators at Kemptown Exchange, Brighton, has been transferred to Guildford as Chief Operator, and on leaving Brighton was presented by the staff with a gold bracelet.

Mr. S. C. BENTLEY, Contract Officer, Brighton, has been transferred to Weybridge in a similar capacity, and Mr. A. L. EDWARDS, Contract Officer, Brighton, has been transferred in a similar capacity to Dorking.

Mr. H. WHENMOUTH, Apprentice, has been appointed Assistant Engineer, Walthamstow.

Miss FLORA BROUGH, Senior Operator, Charing Cross Exchange, Glasgow, has been promoted to be Supervisor in Argyle Exchange. The staff presented her with a silver and enamel necklace and brooch, which they asked her to accept with their best wishes.

Mrs. ISABELLA BONHAM, Supervisor at Brighton, has been appointed Travelling Supervisor for Bolton, Oldham and Warrington districts, with headquarters at Bolton. The Brighton staff have presented her with a mackintosh coat and a lady's bag.

Miss MILDRED WINTER, Operator, Bristol, who has resigned consequent upon her parents leaving the town was, before leaving, presented by the Traffic Manager on behalf of the staff with a silver-backed hair brush and comb.

Mr. H. Y. STARKEY, Assistant Engineer, Yarmouth, has been transferred to Luton district in a similar capacity.

Mr. W. E. PEARSON, Sub-Engineer, Birmingham, who was transferred to Leicester as Assistant Engineer, was presented with a case of razors by the Birmingham engineers' staff. The presentation was made by Mr. Bagley, in the absence of the Engineer.

Mr. E. L. HAGUE, Sub-Engineer, Leicester, who has been transferred to Cardiff as Assistant Engineer, was incorrectly described last month as Hayne.

Miss GEORGINA MARION TURNER, Clerk-in-Charge, Ashton, has been transferred to a similar position at Oldham.

Miss FLORENCE DRIVER has been promoted from the position of Senior Operator, Ashton, to that of Clerk-in-Charge, Ashton.

Miss A. ELIZABETH HAMMOND, Operator, Leicester, was presented with dressing-case fittings by the operating staff on the occasion of her resigning the service.

On the visit of Mr. WOODS (who has been transferred to Margate) to the Cambridge Exchange to bid farewell to the staff he was presented with a letter case and brass inkstand, with congratulations on his recovery from six months' serious illness, and good wishes from everyone for his future health and prosperity. The presentation was made by Mr. J. Stuart Best, Engineer and late Acting Local Manager, on behalf of the office, engineering and operating staffs.

Foreman W. H. A. COLES has been transferred from Cheltenham to Chippenham as Lineman-Inspector.

Inspector D. S. CLAYSON, Nottingham, has resigned the Company's service to take up another position, and was presented by the District Manager with a fountain pen as a mark of esteem from his colleagues.

Mr. T. J. HALL, Residential Lineman-Inspector, Chatham, was presented by the members of the Chatham staff with a walnut biscuit barrel on the occasion of his leaving the Company's service.

Mr. FRANK PINDER, after eight years' service, has been promoted to be Foreman of the Table Set Department, Nottingham Factory.

Mr. J. W. HAMBLETON, Engineer-in-Chief's Department, Nottingham Factory, has secured in open club competition the twenty-guinea silver cup offered by the Nottingham Caledonian Quoit Club, a large number of whose members are drawn from the Company's staff.

On the occasion of Mr. A. H. KINGSCOTE's leaving the Company's service to take up a position as Assistant Engineer to the United River Plate Telephone Company, Limited, Buenos Ayres, a dressing case and combination knife was presented to him by the whole of the staff. This was supplemented by a fountain pen from the Engineering Department. He entered the Company's service in Bristol in 1902 as an apprentice. In 1905 he was appointed Inspector, 1906 Exchange Inspector, and in 1907 was transferred to the Engineering Department, and finally had charge of one of the three districts into which Bristol centre is divided. On making the presentation, Mr. Preston wished him God-speed in his new venture, and hoped that he would enjoy the best of health.

Liverpool District.—In connection with the re-organisation of the staff in consequence of the amalgamation of Birkenhead with Liverpool, the following appointments have been made:—

Electrical Staff.

Construction Electrician for Liverpool and Birkenhead area, Mr. W. K. Wood. Maintenance Electrician for Liverpool and Birkenhead area, Mr. J. O. Cooper. Divisional Maintenance Electricians: Central Exchange, Mr. C. Hill; Royal and Bank Exchanges, Mr. H. J. Mullins; Bootle and Northern sub-exchanges, Mr. E. W. Rowson; Liverpool sub-exchanges, Mr. C. Williams; Birkenhead and Rock Ferry Exchanges, Mr. J. D. Whittle; Liscard and Birkenhead sub-exchanges, Mr. A. Savage. Exchange Electricians: Central Exchange, Mr. T. W. Wickham; Royal Exchange, Mr. A. W. Bibby; Bank Exchange, Mr. J. Bell; Bootle and Northern sub-exchanges, Mr. W. A. Utting; Liverpool sub-exchanges, Mr. D. Levy; Birkenhead and Rock Ferry Exchanges, Mr. R. Harrison; Liscard and Birkenhead sub-exchanges, Mr. H. J. Partington.

Traffic Staff.

Exchange Manager controlling all Liverpool sub-exchanges, Mr. J. Parry; Exchange Manager controlling all Birkenhead and Rock Ferry Exchanges, Mr. J. T. Williamson; Exchange Manager controlling all other Birkenhead sub-exchanges, Mr. R. E. Edwards; Matron, Miss E. M. Jones.

Engineering Staff.

Divisional Engineer for Office, Mr. A. Coleman; Divisional Engineer for Underground, Mr. J. Nevin; Local Engineer for Underground, Birkenhead, Mr. E. Shepherd; Local Engineer for Underground, Liverpool and Bootle, Mr. H. Briscoe: Divisional Engineer for Overhead, Birkenhead, Mr. J. Parker; Local Engineer for Overhead, Birkenhead, Mr. S. W. Drummond; Divisional Engineer for Overhead, Liverpool and Bootle, Mr. R. Hunt; Local Engineer for Overhead, Bootle, Mr. C. Inman; Chief Wayleave Canvasser, Mr. T. W. Jackson.

Liverpool Technical School.

Mr. A. Roberts, Electrician, has been appointed Lecturer on "Telephony" for the forthcoming session at the Liverpool Technical School.

London Traffic Department.—*Promotions and Transfers:*

Mr. GUY BUCKERIDGE, Exchange Manager, East, has been made Exchange Manager, Paddington.

Mr. ROBERT J. FERGUSON, Exchange Manager, Westminster, has been appointed Exchange Manager, East. He was presented by the operating and maintenance staffs with a silver cigarette case and match box, accompanied by their best wishes and expressions of regret at losing him.

Mr. ROBERT M. TEEBOON, Exchange Manager, North, has been appointed Exchange Manager, Westminster.

Mr. CHARLES EATON has been promoted from the maintenance staff to be Assistant Exchange Manager, North.

Miss BEATRICE ASHMEAD, Clerk-in-Charge, Battersea, has been made Clerk-in-Charge, Paddington. She was presented by the staff of the South-Western district with a gold brooch set with pearls.

Miss ETHEL TRINGHAM, Senior Supervisor, London Wall, has been promoted to be Clerk in-Charge, Westminster. She was presented by her colleagues with a curb bracelet.

Miss JANE FREEMAN, Operator-in-Charge, has been made Supervisor-in-Charge, Woodford.

Miss ADA BUCKWELL on the occasion of her transfer from Westminster to Battersea as Clerk-in-Charge was presented by the Westminster staff with a single-stone diamond ring, accompanied by their best wishes for her future welfare. The staff were unanimous in their expressions of regret at losing Miss Buckwell as their clerk-in-charge.

Miss GERTRUDE BERRY, on her promotion from the Operating School to be Supervisor at London Wall Exchange, was presented by her former colleagues with a pearl brooch.

Miss ETHEL GALLIVAN was presented with an oak biscuit barrel and pearl-handled cake knife by the Westminster staff on the occasion of her transfer to the Bank Exchange as Supervisor. She has since been transferred to the Operating School as Supervisor.

Miss JEANNIE BURT, on leaving the Company's service at Westminster Exchange, was presented with a gold locket.

Miss ALICE CLARK, of Westminster Exchange, who recently left the Company's service, was presented with a silver-backed hair brush and comb and clothes brush.

MARRIAGES.

Miss MAY HARVEY, Senior Operator, Bristol, on resigning to be married, was presented by the Traffic Manager, on behalf of the staff, with a handsome Queen Anne teapot and cream jug.

Miss ENID GARDNER, Senior Operator, Bristol, who has resigned to be married, was presented by the staff, as a token of esteem, with a handsome brass spirit kettle and stand. It was a happy coincidence that the date of Miss Gardner's leaving coincided with the first arranged meeting of the operators society, at which she herself gave a paper on "Courtesy." The District Manager, amidst a scene of much enthusiasm, made the presentation with a few happy remarks, supported by the Traffic Manager and Clerk-in-Charge.

Miss ETHEL WINIFRED TAYLOR, Clerk-in-Charge, Oldham, was presented with a silver-plated tea service, suitably engraved, by the combined staff of the Oldham centre, upon her resignation in view of her approaching marriage.

Mr. W. C. HARRIS, Inspector, Plymouth, was presented with a marble clock on the occasion of his recent marriage. The presentation was made by Mr. G. Hooper, District Manager, on behalf of the staff.

Miss ETHEL CROCKER, Operator, Plymouth, resigned the service on Sept. 30 to get married and was the recipient of a set of cutlery from the staff which was presented by Miss Westlake, Clerk-in-Charge, Plymouth.

A presentation of cutlery, etc., was made by the Leicester staff to Mr. ERNEST RENDELL, Switchroom Inspector, Leicester, and Miss B. MURIEL SMITH, Operator, Leicester, formerly Operator at Royal and Wavertree Exchanges, Liverpool, on the occasion of their marriage.

Mr. F. YATES, of the Cost Department, Manchester, was married on Sept. 15, and was presented by the staff with two handsomely upholstered rocking chairs.

Mr. I. J. GODFREY, the Resident Inspector for Bacup area, was presented by his colleagues of the Bury area with a walnut table on the occasion of his marriage at Bristol on Oct. 2.

Miss ALICE N WHYTE, Clerk-in-Charge, Gorbals Exchange, Glasgow, who resigned on Aug. 12 to be married, was presented with an umbrella and purse-bag by the chiefs and senior officers of the Traffic Department.

Miss CHRISTINA F. ALLISON, Clerk-in-Charge, Hillhead Exchange, Glasgow, who left on Sept. 4 to be married, was presented with cutlery by the chiefs and senior officers of the Traffic Department.

Miss E. PAXTON, Operator, Hull Exchange, resigned on Sept. 23 to be married. She was presented with a set of ornaments.

Mr. D. CONNELLY, Wages Clerk, Belfast, was presented by the staff with a gold signet ring on the occasion of his marriage on July 14. Mr. Stewart, District Manager, made the presentation.

Miss MARGARET ROBERTSON, Senior Operator, Leith Exchange, left after ten

years' service to be married. She was presented by friends there and in Edinburgh with a silver cake basket.

Mr. ALBERT S. SELL, Lineman-Inspector, Ashford, was on the occasion of his marriage presented with a case of carvers, subscribed for by the staff of Canterbury centre.

Mr. C. BAINBRIDGE, Stores Clerk, district office, Middlesbrough, was presented by the staff with a handsome regulator clock on the occasion of his marriage.

London Traffic Department.—*Resigning to be Married :*

Miss EDITH ARNOLD, Exchange Clerk, Paddington, who left on Sept. 16 to be married, was presented by the operating staff with a dinner service and silver butter knife. She also received presents from various colleagues.

Miss EDITH EDMONDS, Operator, Holborn, on leaving to be married was presented by the staff with a cake basket, jam spoon and butter knife.

Miss VICTORIA HENDERSON, Operator, Dalston, who resigned on Sept. 2 to be married was presented by the staff with an electro-plated cake basket. Miss Henderson was very popular with her colleagues, from whom she received many handsome presents, including copper water jug, brass spirit kettle, pickle jar and stand, tray cloth, d'oylies, afternoon tea cloth, fruit dish, glass sugar sifter and other gifts.

Miss GERTRUDE BENSON, Operator, London Wall, on leaving the Company's service in view of her approaching marriage was presented with an *épergne*.

Mr. WILLIAM BATES, Night Operator, of the Western district, was married on Sept. 25 at St. John's Church, Goose Green, East Dulwich. The night operating staff of the Western district, presented their colleague with a marble clock and testimonial as a token of their appreciation, and unite in wishing him a very happy and prosperous married life.

OBITUARY.

It is with regret we have to announce the death of Miss ANNIE LOUISE WALKER, who for the last three and a half years has been one of the most popular members of the Derby operating staff. Miss Walker had been in poor health for some time, having undergone a painful operation, from the effects of which she never recovered. The funeral took place at Derby on Sept. 28. Floral tributes were sent by the Company's staff, and also by the local Post Office staff, both being represented at the funeral.

A verdict of "Found drowned" was returned in the case of Mr. CHAS. W. TUGWELL, Contract Officer, at Watford, whose body was recovered from the River Colne on the morning of Sept. 22. So far as could be ascertained, there was no reason why deceased should take his life, and it is assumed that, being short-sighted, he accidentally fell into the river and was unable to recover himself. Mr. Tugwell, who was of a very cheerful disposition, entered the Company's service in May, 1899, and, with the exception of a short period at Tunbridge Wells and Brighton in 1901, he was employed the whole time as Contract Officer at Watford.

STAFF GATHERINGS AND SPORTS.

Edinburgh.—*Ampère Golf Club.*—The final of the summer hole-and-hole competition was played over the Braid Hills Course on Sept. 25, when Mr. Chas. Macfarlane (clerical staff) defeated Mr. John Robertson (electrician) by 3 up and 2 to play.

A few members of the staff spent a very enjoyable afternoon at Currie on Oct. 2, the occasion being a game of "Bools" with the village club. Two rinks participated in the game, one skipped by Mr. W. Hislop (Contract Office) and the other by Mr. W. Wilson (Electrician's Office), and after the usual 21 ends the National Telephone Company's men were the victors by five shots. The arrangements for this second season's invitation were in the hands of Mr. Lumsden, Traffic Manager, who is a member of the Currie Club. The game of bowls is being taken up enthusiastically by a number of the staff at Edinburgh, and the inception of a club is spoken of.

Leeds.—*Northern Province.—Chamber's Cricket Challenge Cup (Final).*—The above match was played on the New College Ground (kindly lent for the occasion), Harrogate, on Aug. 28. The competing teams were the Durham District Club (winners 1908) and the Mid Yorks Club (winners 1907). The Mid Yorks team batted first, and ran up the respectable score of 77, and, largely owing to the excellent bowling of Messrs. Walker and Keighley (5 wickets for 12 and 5 wickets for 15 respectively), the Durham team were got rid of for 34. The Mid Yorks district are therefore the holders of the cup for the next twelve months. On presenting the cup to Mr. C. W. Blackburn, captain of the winning team, Mr. Hann, Chief Clerk, Middlesbrough, remarked that the presenting of a cup for competition had done much to foster good feeling between the different members of the staff in the various districts of the province.

Under the auspices of the telephone society a whist drive was held at Leeds on Oct. 6. The available space allowed of tables being set for 60. These were fully occupied by members of the staff, who had an enjoyable time. Refreshments were provided. Mrs. Cowburn graciously distributed the prizes.

Cambridge.—On Oct. 9 a special social evening was given by the exchange staff to Mr. and Mrs. J. Stuart Best, at the Dorothy Café, on the occasion of the completion of the new central battery system. An excellent musical programme was arranged, a special feature being a sketch entitled "A Suffragette Committee Meeting," performed by the operating staff, and specially written by Mr. H. J. Herink. During the interval the presentation of a dressing case and a case of fish knives and forks was made to Mr. and Mrs. Stuart Best respectively as a token of the great esteem and regard entertained for them by the staff. Mr. Stuart Best, Supervising Engineer, has also been lately acting as Local Manager, and during that time he has won the affection of all the staff. With the presentation a parchment was also given on which were inscribed the names of all the subscribers. Letters regretting their absence were received from Mr. E. T. Titterington, Sectional Engineer of the Post Office; Mr. Gambling, Assistant Borough Surveyor, Mr. McGillivray of the Cambridge Electric Supply Company, and Mr. O. W. Stevens, the District Manager, in whose unavoidable absence the presentation was made by the Clerk-in-Charge, Miss D. L. Tabor. Supper was also served during the interval. The arrangements were made and successfully carried out by Messrs. H. J. Herink and A. J. Coulson.

On Oct. 11 the outside staff presented Mr. and Mrs. J. Stuart Best with a silver teapot and a silver matchbox, following this up by a smoker given to Mr. Stuart Best at the Eagle Hotel, on Oct. 15. Although quite impromptu, the smoker was exceedingly successful, the whole of the male staff being present. Mr. F. Summarsell, the new Local Manager, acted as chairman and Mr. Herink as accompanist.

Manchester.—The telephone society opened the 1909-10 session on Oct. 16 with a social evening, comprising whist drive, lantern entertainment and concert, presided over by Messrs. G. S. Wallace, Chief Electrician, and A. Magnall, District Engineer. The prize winners in the whist drive were Miss Billing and Mr. G. F. Staite. The lantern entertainment given by Mr. J. Hayward (a member of the staff), entitled "Among the Lakes and Fells of Cumberland with a Camera," consisted of over 100 lantern slides of his own production. This entertainment was arranged for the benefit of those who did not wish to take part in the whist drive. Later a very successful concert was held, consisting of songs, recitations and monologues. A most enjoyable evening was spent by about 110 members of the staff and friends.

Chatham.—On Oct. 9 a walking race took place from Chatham Cemetery to the Lower Bell and back, a distance of eight miles. The weather was perfect and a splendid race was witnessed, the winner's time being especially good. The race was under sealed handicap conditions, and the winners and times were as follows:—First, W. Lock, 1 hour 16½ minutes; second, A. Lock, 1 hour 19½ minutes; third, T. Griggs, 1 hour 21½ minutes. A consolation prize was awarded to H. Ford, who lost the third prize by 30 seconds. In the evening an enjoyable smoking concert was held at the Gibraltar Hotel, where the prizes were presented by the Local Manager (Mr. J. C. Nichols), the musical programme being contributed to by the following members of the staff:—Messrs. Bell, Rouse, Sills, Chapman, McCoy, Griggs, Drew, Ford and Lock. The prizes were as follows:—First, a case of carvers; second, a clock; third, a knife.

Glasgow.—*National Telephone Bowling Club, Glasgow.*—The first annual smoking concert and presentation of prizes in connection with the above club took place on Oct. 15 in the Christian Institute, Bothwell Street, when there was a large turn-out of members and friends. The chair was occupied by the president, Mr. W. S. Mackie (Construction Department), supported by Messrs. Forrester and Ferguson (Contract), McDonald (Clerical), and Warnock (Engineering). The outstanding feature of the evening was the presentation of prizes, which was ably carried out by the president in an agreeable manner. The musical part of the programme was ably sustained by the following gentlemen:—Messrs. A. Blair, J. Sinclair, W. Wright, H. Sutherland, J. Fenton, Tom Paton and McMillan, Anderson, Cameron and McLachlan (Queen's Park Male Voice Quartette). Messrs. James Gray and T. Pryde presided at the pianoforte. The club is in a very flourishing condition and the members are looking forward to the opening of next season, more especially to the match with the Cowlairs Bowling Club. This will take place on the occasion of the opening of the Cowlairs new greens, to which the telephone men have had the honour of being invited, and they will there meet the Under Secretary for Foreign Affairs (Mr. T. McKinnon Wood, M.P.). The trip to Belfast, on the invitation of the members of the Ballynafeigh Bowling Club, is also being anticipated with pleasure. The prize winners were as follows:—*Championship:* Winner, A. D. Keir (Engineers); runner up, R. Stevenson (Engineers). *Pairs Game:* Winners, J. Sinclair (Bridgeton Exchange) and J. Forrester (Contract). *Rink Game:* Winners, A. S. Brodie (Contract), W. Wright (Contract), T. Curr (Contract), A. Reid (Tron Exchange). The club played during the season four matches, three of which were lost and one won.

LOCAL TELEPHONE SOCIETIES.

Birmingham.—The first meeting of the 1909-10 session took place on Oct. 5. Mr. Latimer, of the Engineer-in-Chief's office, read a paper entitled "A Description of the Manufacture of the Company's Dry-Core Cables," which was much appreciated. It was illustrated by limelight views, and some discussion followed. Mr. Coleman presided and presented the prizes won by Mr. J. Tuffin and Mr. W. H. D. Gray for the best local papers given during the last session of the telephone society, and also the certificates to the various members of the staff who had been successful in last session's Correspondence Classes.

Birmingham Operators.—The first meeting was held on Oct. 14, the chair being taken by Miss E. J. Williams, when a paper was read by Miss Jones, of Liverpool, on "The Training of Operators," which dealt with many details of an operator's training and touched upon the tact and discretion required for a successful operator. A very ready discussion was entered into at the conclusion. Mr. Coleman, the Provincial Superintendant, in passing a vote of thanks to Miss Jones said that it was the first operators' meeting that he had attended, and that he was much surprised with the meeting and the way in which the operators joined in the discussion; he was sure the meetings must help to bring operators up to present requirements. He congratulated Miss Jones, not only on her splendid paper but also upon the able manner in which she answered the numerous questions put. A social gathering followed the business meeting with a varied programme provided by members of the staff, the following taking part, Miss E. M. Farmer, Miss E. Fisher, Miss D. Banham, Miss L. Clift, Miss A. Tipper, Messrs. Allen, Silver and Glass.

Brighton.—On Oct. 11 Mr. Roberts, Brighton Local Manager, gave a lecture on "Transmission," illustrated with lantern slides. The lecture, which took about an hour and a half to deliver, was most interesting, and twenty minutes'

discussion ensued. There was a good attendance. Mr. C. F. Moorhouse, District Manager, took the chair.

Bristol.—The first sessional meeting was held on Oct. 14, when Mr. John O. Eardley, Stores Clerk, District Office, gave a paper on "The Two Ends of a Telephone Line." The paper was greatly appreciated by an attendance of 67, representing 70 per cent., and it was pleasing to note a good attendance of ladies and line staff. Mr. A. Perkins, president, was in the chair, and if this meeting is any criterion of what is to follow the success of the society for the session is already assured.

Bristol Operators.—The first sessional meeting took place on Oct. 14, when three papers were given by members of the operating staff, Misses E. Gardner, E. Hunt and M. Russett, on "Courtesy," "Intelligence" and "Enthusiasm" respectively. There was an attendance of 64, representing 98 per cent. of the staff, and an animated discussion ensued upon all subjects. The Provincial Superintendent, Mr. R A. Dalzell, occupied the chair. A specially pleasing feature of the gathering was the presence of staff from the out-centre exchanges, and future meetings are being looked forward to with keen interest.

Cardiff.—A general meeting was held on Sept. 6, when the syllabus was arranged for the session 1909-10. The following officers have been appointed: President, Mr. R. A. Dalzell; vice-presidents, Messrs. B. Waite, J. James, W. H. Kirk and W. J. Marsh; secretary, Mr. G. R. Woodworth; treasurer, Mr. E. O. Phillips.

Cardiff Operators.—The first meeting was held on Oct. 12, the president, Mr. B. Waite, taking the chair. All the vice-presidents and 60·3 per cent. of the members were present. The meeting was arranged as a competitive night and four papers were given, as follows:—"How Enthusiasm and Interest Help and Affect an Operator's Working," by Miss M. Critchett. "Criticism of Standard Expressions. Suggested Improvements," by Miss H. van Riel. "Sub-Exchange Working. Should it Improve or Detract from Operating," by Miss A. M. Whittle. "Do Subscribers in General Understand Exchange Working," by Miss E. Parry. Several operators as well as the president and vice-presidents took part in the discussion which followed. The vice-presidents acted as adjudicators, who awarded the first prize of 7*s.* 6*d.* to Miss Hilda van Riel and the second prize of 5*s.* to Miss A. M. Whittle.

Cheltenham.—The preliminary meeting for the re-election of officers (*en bloc*), and the confirmation of the balance sheet and the syllabus and arrangements for the 1909-10 session, was held on Oct. 12. Mr. C. Elliott (District Manager) was in the chair and the whole available staff was present. The enthusiasm displayed augurs well for the prosperity of the coming session. A successful whist drive and dance, at which over 40, including Mr. and Mrs. Elliott, and Mr. and Mrs. Pike, attended was held from 8.30 p.m. to 4.30 a.m., to inaugurate the session. The whist prizes were kindly distributed by Mrs. Elliott and won by Miss E. N. Taylor, first; Miss B. B. Wilson, second; Mr. A. D. Pike, first.

Coventry.—The annual meeting was held on Oct. 18, Mr. J. Mewburn, presiding, when the secretary read the third annual report and balance sheet. The election of officers was then proceeded with and resulted in the following being re-elected:—President, Mr. J. Mewburn; vice-presidents, Messrs. W. Dickinson and J. N. Lowe; secretary, Mr. W. H. Oliver.

Douglas.—The Isle of Man Telephone Society held its first meeting at 7.30 p.m. on Sept. 30. President and officers were elected and papers arranged to be given during the session. It was also arranged that prizes be given for the three best papers, the best suggestions or devices for improving the Company's local system of working in each department and the best timekeeper in all departments. It was also proposed to buy some standard works for lending amongst the staff.

The second meeting was held on Oct. 15. A paper was read by the District Manager on "The Main Points in the Upkeep of an Underground System." An interesting discussion ensued.

Dublin.—The first meeting of the 1909-10 session was held on Oct. 18, at which the prizes were awarded to the successful competitors of the 1908-9 session. First prize (£1 1*s.*) to F. Scannell, for paper on "Ireland's First Central Battery Exchange"; second prize (15*s.*) to G. Kirkwood, for paper on "Sub-Exchange Construction"; third prize (5*s.*) to J. Tyrrell, for paper on "Inspections." The committee has arranged a scale of prizes for papers to be read by the junior members of the staff at the forthcoming meetings, a special feature being a members' night for short papers. The opening night was devoted to a paper on "The Ineffective or Lost Call, and Accuracy in Recording," by Mr. R. Morgan, the Traffic Manager.

Glasgow.—The first meeting of the session was held on Oct. 13. Mr. Gilbert presided over an attendance of 147 members. Mr. W. W. Cook, Assistant Engineer-in-Chief, was the lecturer, the title of his address being "Mainly about New York." After defining the frame of mind in which one should visit another country, Mr. Cook dealt with the following points:—The reasons for the success of telephony in America; attention paid to education of the public; special methods to cope with peculiar American conditions; equal development of all branches; standardisation of plant and methods. Many lantern slides were shown, and the cumulative effect of the lecture was to impress the audience with a sense of the vastness of the American telephone undertakings. After a number of questions had been asked and answered, a vote of thanks was given to the lecturer. A pleasant half-hour was thereafter spent in social intercourse, this innovation proving an unqualified success.

Gloucester.—The first meeting was held on Oct. 14, Mr. W. J. Norman, vice-president, being in the chair. General business having been discussed Mr. C. Elliott, District Manager, read a most interesting paper on "Telephone Progress—Past and Prospective." In a very clear manner he defined by diagram and figures the development of telephony. The District Manager having discussed the great advancement of the telephone to the present time, proceeded to show by statistics that the possibilities of progress in telephone business are still very considerable in most towns throughout the United Kingdom, particularly referring to those in the Gloucester district. The paper was very keenly discussed by Messrs. de Medewe, Ffrench, Hare and others.

Greenock.—The first meeting was held on Oct. 12, Mr. A. Ramsay Lamb, president, in the chair. Mr. W. W. Cook, Assistant Engineer-in-Chief, delivered an address on "Some Fundamentals of the Telephone Business." The lecturer was listened to with great interest by the large number of members present, and a discussion followed. The address was illustrated throughout by very graphic lantern slides.

Hastings and Eastbourne.—The first meeting took place on Oct. 12, when there were 33 members present. Mr. F. W. Roberts, Local Manager, Brighton, gave a most interesting lecture on "Transmission," including the origin of speech waves, factors of inductance, capacity, resistance and leakage, leading up to the attenuation constants and factors, transmission equivalents, and construction of junction and subscribers' circuits. The lecture was illustrated by lantern slides, and greatly appreciated by all present. Mr. E. Armstrong was in the chair.

Leeds.—A meeting was held on Oct. 13. The Provincial Assistant Superintendent, Mr. A. Martin, opened with an address which he designated "Scraps." This was listened to with interest and generally well received. The president, Mr. W. V. Morten, followed with "An Exposition of the Purpose of the Society, and the Policy of the Committee." Attendance, 72 per cent. of membership.

London.—The first meeting of the session was held on Oct. 4, with an attendance of 169 members. The president, Mr. L. Harvey Lowe, was in the chair. Mr. E. Hare, the Assistant General Superintendent, read his paper entitled "Control." The following members took part in an interesting discussion:—Messrs. A. Gray, J. Stirling, T. Coburn, B. Gifford, J. M. Shackleton, J. F. Edmonds, G. Greenham, A. Watts, G. Napier, A. Wright, Misses K. Hooper, E. Ralph and F. J. Minter. Mr. E. Hare replied to all points raised and the meeting concluded with a vote of thanks to him. The officers of the society for 1909-10 are: President, Mr. L. Harvey Lowe; vice-presidents, Mr. J. F. Edmonds, Mr. W. F. Taylor and Mr. J. Stirling; hon. secretary and treasurer, Mr. W. K. Cherry. Those for the newly formed Traffic branch are: Chairman, Miss F. J. Minter; vice-chairmen, Miss G. Berry and Mr. W. B. Benham; hon. secretary, Miss K. Hooper.

London (Traffic Branch).—The first meeting was held on Oct. 18, when a paper was given by Mr. Gill, Engineer-in-Chief, on "Standardisation and the Operator." Three hundred and fifty-eight members were present, and it is hoped that this figure will be maintained during the session. The chair was taken by Miss F. J. Minter, who announced that the membership of the traffic branch was 609. Mr. Gill then read his paper. He said that he wished to convey his sincere thanks to the traffic branch for the honour of being asked to give the first paper. He would speak especially to the operating staff. He stated that the telephone service demands high-class work, and that what is wanted from everyone is self respect in his or her work. A discussion then followed in which Misses Ladell, Reekie, Russell, Tringham, Berry, Turner, Etheredge, and Messrs. Townsend, Edmonds and Poole took part. Mr. Gill replied to the questions, and a vote of thanks to him was passed.

Luton.—The opening meeting of this society was held on Oct. 13, when Mr. J. H. Wilson, District Manager, gave a lecture on "Development." There was a large attendance of members who had the pleasure of listening to a highly interesting address, which was followed very closely by those present. For the session just entered upon Mr. J. H. Wilson was re-elected president and chairman, with Mr. Beck as secretary and Miss Whitmore treasurer. A good number of papers have been promised and a successful term is anticipated.

Manchester.—At a general meeting the officers for the forthcoming session were elected as follows:—Past presidents: Messrs. R. H. Claxton and A. Magnall; hon. president, Mr. R. Shepherd; president, Mr. Wallace; vice-president, Mr. W. Cleary; hon. treasurer, Mr. J. Heyward; hon. secretary and librarian, Mr. H. Hyde. On Oct. 22 a paper on "Outside Plant" was read by Mr. A. Magnall.

Newcastle.—The session was inaugurated on Oct. 5, when Mr. F. Gill (Engineer-in-Chief), gave a paper on "Some Intermediate Problems in Telephone Design," illustrated by lantern slides. Mr. A. L. E. Drummond presided. The paper was followed by a short discussion, in which the chairman and Messrs. Marshall, Fisher and Gaskins took part.

Paisley.—The first meeting of this society was held on Oct. 8, Mr. A. W. Grant, in the unavoidable absence of the president, Mr. R. Audsley, being in the chair. A very interesting lecture was delivered by Mr. A. Ramsay Lamb, vice-president. There was a large turn-out of members.

Stirling.—The first session of this new society was inaugurated on Oct. 12, when Mr. Edmond, District Manager, read a paper on "Traffic."

Swansea.—A general meeting was held on Sept. 27, when officers for the coming session were elected as follows:—President, Mr. W. E. Gauntlett; vice-presidents, Messrs. W. J. Hodgetts and H. G. McArthur; secretary, Mr. W. H. Crook; treasurer, Mr. R. A. Skinner. A committee, composed of representatives from each department, was also elected.

Swansea Operators.—The members of the above society held a preliminary meeting on Sept. 29, when officers for the coming session were elected. An excellent syllabus is being arranged, and a very successful session is anticipated.

Western (London).—The 1909-10 session of this society opened in September and the programme arranged augurs well for another interesting and instructive session. The officers and committee elected for the ensuing year are as follows:—President, Mr. F. M. Hall; vice-presidents, Messrs. R. H. Drury and J. H. Stewart; hon. secretary, Mr. E. Layton; committee: Messrs. T. A. Beck, G. E. Boniface, W. A. Coolbear, F. H. Hayden, W. Hills, E. W. B. How, R. F. Martin, J. McLeish, E. H. Milne, W. A. Sullivan and F. Woollard.

Wolverhampton (*North Midland District*).—The first meeting was held on Oct. 8. The chair was taken by Mr. Archer W. Smith, District Manager, who delivered an interesting opening address, including in it a report of the work carried on by the society during the past session, with its results. After this address one or two short speeches were made in connection with meetings of the present session, which are being looked forward to with great interest. The latter part of the evening was devoted to songs and recitations by various members of the staff. The number present was 72.

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TELEPHONE MEN.

XLIII.—LORD HARRIS, G.C.S.I., G.C.I.E.

GEORGE ROBERT CANNING, BARON HARRIS, was born in Trinidad in 1851, and educated at Eton and Christchurch, Oxford. In 1874 he married Lucy Ada, daughter of Viscount St. Vincent, and between that date and 1885 he occupied himself with county business, in estate management, and in travelling about the world. Since that time Lord Harris has occupied several important administrative positions. He was Under-Secretary of State for India in Lord Salisbury's first Administration, and subsequently he was Under-Secretary of State for War for four years. He then went to Bombay for five years as Governor of that Province. On his return to England he represented the Home Office in the House of Lords, and was Lord-in-Waiting to Her Majesty Queen Victoria for five years. He was appointed Deputy Adjutant-General of the Imperial Yeomanry in England and South Africa, and he was on the staff of the Imperial Yeomanry during the war. He has, in addition, commanded the Royal East Kent Yeomanry for thirteen years, retiring as full Colonel, and is A.D.C. to His Majesty King Edward.

Lord Harris' connection with the telephone began in 1895, when he joined the Board of Directors, upon which he has sat for the past fourteen years, acting as Vice-President of the Company from 1895 to 1901. He is also a member of the Finance Committee of the Board.

His sound judgment is highly appreciated by his colleagues. He has taken a prominent part in directing the affairs of the Company, and has had the gratification of seeing the wonderful development of the telephone industry which has taken place since he became a director.

Lord Harris took great interest in the Telephone Athletic Association, and is one of the original trustees of the Pension Fund, which was created in 1896. In him the staff have a true and valued friend.

Lord Harris is and has been for many years Chairman of the Consolidated Gold Fields of South Africa, that great organisation which holds an important interest in so many of the gold-producing companies in Africa. The annual meeting of that company is always awaited with much interest, and his unique knowledge of the gold mining industry makes his speech on such occasions a veritable pronouncement as to the progress and position of the gold fields.

Notwithstanding the distinguished offices which Lord Harris has held, it is perhaps by his achievements in the cricket field that he is most widely known to a large section of the community, and his name is a household word wherever pure and strictly amateur sport is held in honour. He has gained every distinction which is obtainable in the national game. After captaining the Eton XI, he was four years in the Oxford XI, playing three times against Cambridge. He has represented the Gentlemen *v.* Players on numerous occasions, and was captain of the Kent County XI for thirteen years, playing regularly for that team from 1874 to 1889, and intermittently thereafter down to 1906. He went out to Canada with the Gentlemen of England XI in 1872, and captained the English team which went out to Australia at the end of 1878. He also captained the English side in the first England *v.* Australia match played in this country—that at the Oval in 1880. The year 1884 was probably his most successful season, when he made more runs than any other batsman in first-class cricket.

Lord Harris has served on the Kent Quarter Sessions and County Council for 35 years, and has been Deputy-Chairman and Chairman of the Quarter Sessions for 25 years.

CONTROL.

By EUSTACE HARE, *Assistant General Superintendent.*

(*Concluded from page* 159.)

IT is true that the art of control comes easier to some than to others, perhaps than to most of us; but, believe me, it can be acquired in a greater or less degree by study and judicious application, but it must be backed by reason and knowledge. And to set about it, my advice, for what it is worth, is: get your knowledge first and then search for your model among those who within your own ken have been most successful in governing their particular departments. Analyse their methods and observe the results; but do not imagine that by founding yourself on their outward mannerisms you will achieve what they have achieved; for mannerisms can only be tolerated in strong men and in the original. Nothing is more palpable than the copy, and the ass in the lion's skin is detected as soon as he tries to roar.

You will find this: that their outlook is broad, that, keeping the ultimate end within their view they leave the details to be worked out by others, nor worry if the manner of doing is not strictly according to their own particular methods—so that the issue is successful; that they study the capabilities and limitations of their men and expect from them neither more nor less, and within those limitations they delegate and expect responsibility.

And with regard to responsibility I have to say this: the man who feels he is responsible will carry out his duties best, and therefore it is for you to make him feel it; but having done so, do not undermine his self-confidence by a frequent parade of your own superior wisdom. This is a tempting weakness to be avoided.

And there is another weakness equally objectionable, namely, the miserable fear that unless you keep some particularly able member of your staff in "his place" he will discover he knows more than you do; and you argue that such a catastrophe must be prevented at all hazards. You may, of course, by sheer force keep better and wiser men than yourself from soaring too high, and may even so far abuse their loyalty—forgetting that loyalty between controller and controlled should be a mutual virtue—as to adopt the product of their brains as your own, and thereby gain a vicarious and precarious renown; but although you are, in a sense, controlling your staff, you are not controlling nor guiding the business of your department.

And further, this form of suppression breeds contempt and a sense of injustice—discipline on the surface and ferment beneath—and is diametrically opposed to the interests of the Company; for without doubt it is part of the duty of all in command to see that no lights are hidden behind bushels.

Besides, men or women with brains are not specially ungrateful and although they are shrewd enough to see that as pupils they have outstripped their master, they appreciate the fact that the master was and is still competent and that his training methods are still sound; while the master shines with the reflected glory of the pupil, or at the worst may take comfort in the thought: "I trained him." You may be sure no harm will accrue to yourself in fostering the abilities of your staff.

Another indication of faulty control may be illustrated by and is comprehended in the old rhyme:

> "I do not like thee, Dr. Fell,
> The reason why I cannot tell," etc.,

or, conversely, "Favouritism," and this is perhaps the most pernicious of all weaknesses and is hard to conquer, as are all weaknesses where the personal element interposes. It is almost painful to think that the career of a man, possibly of considerable ability in his particular sphere, should suffer from an unfortunate manner or want of address, or that he should be the victim of an undefined and unreasonable antipathy. I will not dwell upon the point but merely remark that favouritism is not business and it is "not cricket."

In proportion to the practice of arranging and focussing our ideas by thought and reasoning the natural inclination to hasty decisions diminishes, and conversely, the virtue of patience increases, and this may be developed into a habit.

The man who has arrived at a position of authority by a long apprenticeship rather than by genius or bursts of fortune is apt to become groovy and conservative, and consequently, to resent the suggestions of new ideas and methods, and to show his impatience by plentiful showers of cold water on every troublesome innovation that is put before him, particularly if he does not happen, or has not the ability, to grasp it at once. Well, I put this question to the meeting: which of us would not desire to say, "I helped to develop the telephone," rather than, "but for me telephony would be ten years in advance of its present stage?" An exaggeration, of course; but the principle is enacted every time you refuse a patient hearing to anyone who has spent time and trouble in formulating and working out an idea, be it ever so insignificant. And the man with the matured idea is more advanced in the ways of usefulness than he who declines to consider it.

To control effectually you must be prepared to part with detail, otherwise you leave yourself no time to think; your watchword must be "principles and the broad view." It is a common fault, though sentimentally a pardonable one, to linger regretfully over the passing of work which has become almost part of ourselves into other hands. Some of us are weak enough to go further and imagine that it never can be done quite so well by our successor; not necessarily from a conceited over-estimate of our own transcendent ability, but through a feeling that we alone know all its nooks and corners.

Happily we usually find our fears groundless, that all that is necessary is the occasional guiding hand of our own experience, and that the work itself was merely the probationary period of our wider and higher responsibilies.

The other class of staff to which I have particularly referred is the operators. Talk about super and sub-control, about controlling ourselves before attempting to control others; here are the two virtues in juxtaposition with a vengeance! I suppose only those who have done it really know what it is to control the public and one's tongue and temper at the same time, and yet this is the daily experience of our Traffic Department.

If your train is late you can complain, and perhaps do, if you care to waste your time, but you cannot get at the original or even the imaginary offender; if your bootmaker misfits you the actual culprit is mercifully hidden; but the uncontrolled and uncontrollable telephone subscriber is able to vent his irritability and disappointment, and frequently does in no measured terms on the very individual who is doing her best to satisfy his wants.

The position of these ladies is probably unique, claiming the highest indulgence a public can offer; and without aiming at undue adulation you will, I think, agree that those who by their patience, their tact, their self-control have attained supervisory positions in telephone exchanges are worthy of the highest praise from those they have served so admirably.

These two classes, the clerk and the operator, stand out peculiarly as disciples of monotony; and the discipline of the order is upheld by a rigorous observance of concentration. But there is another class of our staff whose duties are anything but monotonous, but where a lapse of the closest control on the part of any member of it may result not only in mistakes but disaster; I mean, of course, the engineering or technical staff—what may be termed the physical force of the Company; those in the higher branches concentrating their alert minds on ever-changing conditions of localities and plant, keeping themselves in touch with modern research and improvements, and, not least, providing for the safety of the men they control, whese ways are sometimes ways of danger.

As we descend the scale the same need for control, unconscious perhaps because more mechanical, is still in evidence; to the onlooker perhaps even more so, for to him the dual control and responsibility of the foreman—the necessary watchfulness, that is over both man and work—is the more in evidence.

Then the wireman on the roof or pole—the envy of weak-nerved beholders on *terra firma*—with the consciousness of the work before him, of his precarious perch, of a broken limb or broken slates; if there is not need for control and concentration here, where is it to be found? The very boy whom we see occasionally with, literally, his foot on the lowest rung of the ladder, or leaning with easy negligent air against the truck he is guarding is emblematic of responsibility and incipient control.

The whole business teems with it, the subject is exhaustless.

Control from top to bottom, personal and impersonal, and I will not weary you with more examples, being a little afraid that already I have over-laboured the obvious.

But, of course, the fact must not be overlooked that in the control of a department the control of the work is included and merged in that of the individual, and broadly speaking, as neither the Company nor the officer in immediate control need, from the strict business point of view, concern themselves in anything but actual results, it apparently follows that the work itself is of the first importance and the individual second.

To carry this idea to a logical conclusion, one might say, and it is not only sometimes said but the theory is sometimes acted upon, that so long as the work is done you have no need to interest yourself in anything concerning your staff outside the yea and nay of your daily business intercourse. This is a subject which demands careful and tactful handling, for it is one in which temperament largely prevails.

Now I believe that a really morose man or woman is a rare bird on this earth, and that the unbending attitude which I have just suggested finds its origin usually in one of three ways; by an overweighted sense of personal dignity, which must not be jeopardised; by shyness; or by a fear that familiarity will impair authority.

With regard to dignity what a man in control has to uphold is the dignity of the Company, or what is the same thing, the dignity of his office; his personal dignity is of no concern to anyone but himself. The duty between himself and his staff is reciprocal, and if he limits his communications with and knowledge of his staff to the mere exactions of business they will do the same, and the authority they acknowledge in not that of himself but of the office he holds; that is to say he will get official obedience without unofficial loyalty. I am, of course, not speaking of the natural dignity consistent with a courteous manner and consideration for the feelings of others, but of the spurious offensive imitation which place and authority occasionally produce, and which where it exists is always so obtrusively in evidence.

Shyness is another matter, and is not to be overcome by any amount of advice. I can only say its unfortunate victims have my sympathy.

There is a great deal more to be said of the idea of familiarity breeding contempt, and that therefore our aim should be to stand aloof from our subordinates; but again, after all, for what reason are we all brought together? Not to record personal successes, not to assert our personal qualities and positions, but to carry on one whole work harmoniously. In the course of time we gain knowledge and experience, and we are expected to be capable of teaching and guiding others, and of taking the responsibility of seeing a complete piece of work fully carried out. It is our knowledge the Company wants, not our personalities nor personal ideas of ourselves.

And thus I come back to my main idea; knowledge is the foundation of control, knowledge of your work and knowledge of your staff. Knowledge is what your staff will bow to, nor, within reason, will any interest you take in themselves, in their achievements, or even in their recreations react on the stability of your position so long as they are able to recognise your sound knowledge of themselves and their work.

To sum up. What I have endeavoured to express in this paper (only, after all, my own poor opinions) is that control is not, and cannot be properly exercised by, mere personality or by a sudden accession to a post of authority, in itself.

There are, of course, times and crises when the air is best cleared by a storm, when stagnation can only be disturbed by sheer force, and when the best weapon for control is a sledge hammer wielded by a masterful hand; but these are passing episodes. Under normal conditions even pure force of character may be a vain thing in itself; it may mean tyranny, obstinacy, or you may call it, if you like, determination; but with nothing behind it, it is only the shadow of the substance, with no lasting influence.

The only foundation of power is knowledge, and to acquire knowledge which is more than superficial in any subject is wearisome to the majority. And if this is true of things it is much more true of the reasoning men and women by whom things are accomplished.

Text books and study will teach you your work, and concentration with experience will make you a master of it; but no text book will teach you how to govern a department of varying entities and characters. This is the highest form of control, and it is only by using the elements which make up control that you can actually gauge the minds and characters of those committed to your charge, and guide them to profitable service in the Company.

A word more and I have finished. We are all growing older, and we have one object in common—the advancement of the great business of which we are merely the current custodians. Keeping this object in view, it behoves us so to control and so to encourage that our mantles may eventually fall on heirs even worthier and more enlightened than ourselves.

LONDON AND ITS ORGANISATION.

By J. STIRLING, *Metropolitan Chief Accountant*, AND H. DAVIS, *Metropolitan Stores and Workshops Manager.*

(*Concluded from page* 137.)

THE Sales Department likewise finds the workshop useful for special work of various kinds. Junction boxes for use on subscribers' own installations are frequently constructed. The other day a special brass push-button frame had to be made to the specified requirements of a purchaser. Instruments which have been damaged by a subscriber or his staff are fairly numerous, and when these are the subscriber's own property they are dealt with on a special works order. Generally, for all sales work, an approximate price is given in advance by the workshop foreman, and considering the scanty information which he has sometimes to work upon, these quotations are wonderfully accurate.

For dealing with maintenance work, such as repairs to relays, cords, etc, which must be charged to the monthly general repairs works order of the division sending the apparatus, a different method is required from that used for the renovation of instruments recovered into stock. Each exchange electrician sends in with the articles for repairs a works order form in duplicate, bearing his general repairs works order number, and describing what he requires. One of the forms is handed to the assistant foreman who in turn passes it to the man who is to carry out the work. The other form is deposited in a works order distributor, having a separate compartment for each divisional electrician's district. In the distributor are also placed all other works orders, in divisions allotted to "Sales," "Electrophone," "Removal Charges," etc. It is thus possible for the workshop's manager or foreman to see readily what work is on hand at any time, and keep in touch with the demands made upon the staff.

When a maintenance works order is completed, the mechanic fills in the number of hours spent; this is checked by the assistant foreman, and the time is inserted by the clerk on the works order duplicate. The latter is returned along with the material to the electrician, and the former is filed. Where the workshops charge seem excessive, it is the exchange electrician's duty to ask for an explanation, and if not satisfied, refer the matter to his superior officer; a similar rule applies to the quality of the work done.

For wages analysis purposes a special time sheet, ruled off in vertical columns, each representing one hour, is used. In the column for the first hour of the day is placed, opposite the name of each man, the number of the works order which is being worked on. Later in the day, if that job is completed, and another given out, the works order number of the latter is inserted in the column representing the hour at which the new work was commenced. At the close of the day, the works order numbers for all jobs in hand at the closing hour are filled in by the clerk; the time sheet is then sent in to the Chief Accountant's Office. All works orders, other than maintenance, are entered on a labour slate, the man-hours being entered up daily from the time sheets.

On the first floor are the instrument fitting benches (Figs. 7 and 8) where all parts of the different types of instruments—wall pattern, pedestal, magneto, central battery—are assembled and fitted together, generators inserted, and the complete instrument made ready for immediate fitting. New parts of instruments from

the manufacturers are also fitted into complete sets and tested ready for use, so that the fitter, when he takes an instrument out, has only to screw it to the wall and connect to the outside line. The average number dealt with is twelve pedestal sets per man per day and six magneto wall sets per man per day.

FIG. 7.—INSTRUMENT FITTING BENCHES (FIRST FLOOR).

The most interesting feature of the whole department is on the same floor. It is the recently fitted transmission testing apparatus, the silence cabinet used in connection with which is shown in Fig. 9. Assistant Foreman P. Swan was responsible for considerable part of the arrangement of the apparatus.

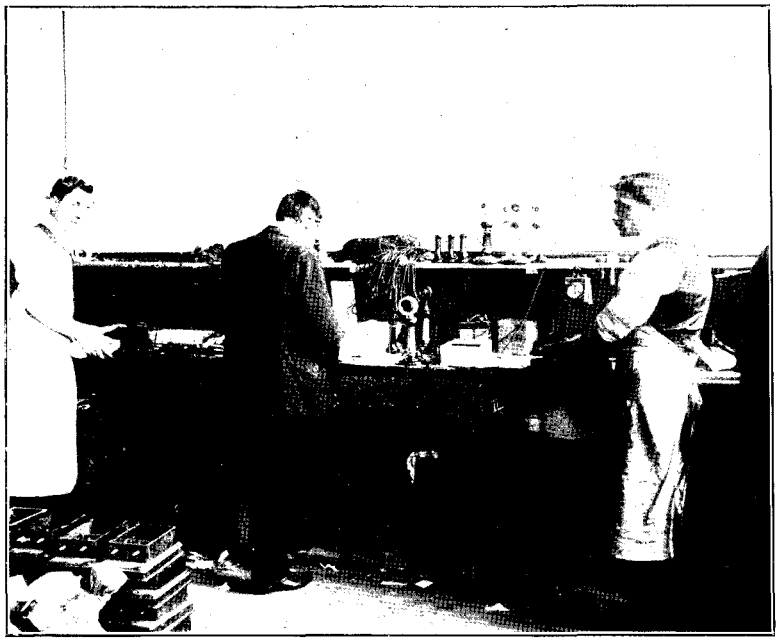


FIG. 8.—SECTION OF INSTRUMENT FITTING BENCHES.

The transmission testing apparatus includes an artificial cable, with varying lengths up to 50 miles. The strength of the current employed through solid back transmitters is 180 to 230 milliamperes, flowing for one hour. At first an extremely loud buzzer was introduced into the circuit for the purpose of exciting the granules whilst the current was passing, but the noise was so great as to affect the hearing of the tester for receiving purposes; a vibrator is now used.

The test for transmission consists of a comparison of speech through a transmitter adjusted to Head Office standard with speech from the transmitter under test. The testing is done over an artificial cable of twenty standard miles, the receiving instrument

FIG. 9.—TRANSMISSION TEST CHAMBER.

being placed in an ordinary cabinet about 30 feet away from the testing chamber. The standard transmitter, receiver and induction coil are sent to Head Office at frequent intervals for readjustment. During the last three months 1,500 solid back transmitters have been subjected successfully to these tests.

There can be no doubt that this special testing work is to exercise a very beneficial effect upon the quality of our transmitting and receiving apparatus, and naturally improve the service given to subscribers. It is certainly of immense advantage to be able to test speech over distances ranging to 50 standard miles, thus showing up faults which could not possibly be discovered with the old short circuit test.

MR. W. PILBROW.

One of the workshop reminiscences is the story of the London Wall fire in 1902, when 100 men, drawn from all parts of the country, were working day and night at cable lacing, jacking and testing. In less than three weeks the whole of the cable for the multiple was completed. Some day perhaps someone who has been "in the thick of it" will tell the tale of the big London fires, what they meant, and how the difficulties were faced. Until that historican arises, we must content ourselves with such snatches of the story as can be gleaned at intervals from participants in the struggles.

The workshop is not on a large scale, but it has done good service and amply justified its existence. Figures of work turned out are, of course, not of much value by themselves, but those I have jotted down from a year's record up to June last may possess a slight interest—

400 central battery wall instruments,
1,500 „ „ pedestal instruments,
225 magneto pedestal instruments,
775 box pedestal instruments with hand micro-telephones,
1025 wall instruments with hand micro-telephones,

1,500 central battery bell boxes,
650 ,, ,, transmitters,
1,700 ,, ,, distributing pole receivers,
1375 party line instruments converted for magneto working,
50 central battery cordless boards,
35 ,, ,, wall boards,
besides a large number of miscellaneous apparatus, including electrophone tables, magneto switchboards, generators, etc.

MR. PHILIP SWAN.

MR. WILLIAM TURNER.

The staff consists of 60 men and boys, the majority of them being excellent mechanics. Foreman W. Pilbrow, who is in charge, has been in the service for 29 years, and we are glad to be able to reproduce photographs of him and his two assistants. There is a splendid *esprit de corps* amongst the men, and as they have recently started a football club, they mean to make a sporting try this season to gain possession of the Clay Challege Cup. We wish them good luck, and if they are as successful in play as at work, the holders of the trophy will have a struggle to retain their laurels.

THE PUBLIC CALL OFFICE.

BY J. M. STEWART, *Contract Officer, Glasgow.*

THE telephone service is now generally conceded to be the most rapid and finished means of communication. It naturally gains in popularity as its advantages in the ordinary daily intercourse of life are experienced.

The public telephone is an important factor in the popularisation of the telephone service; it very effectively educates the public as regards its rapidity and completeness. The pushing merchant is wont to say of *his* goods, "Once used, always used," and on this principle business firms freely distribute samples of their goods, in the expectation of securing customers.

The Telephone Company wants customers too; its success is commensurate with the extent of its sphere of usefulness, which is in direct ratio to the number of its patrons, and the call office acts as the Company's sample to the general public. It is a standing advertisement; an open door to one of the most useful of modern conveniences, the telephone service. By its use practically instantaneous communication, message and reply, can be had in one operation, and at the popular price of one penny per local call It establishes itself as a great time and trouble saver, and of great value in cases of emergency.

About five and a half years ago the Company set out specially to develop its call office system in Glasgow, recognising it as an effective educator and as a means of inducing the telephone habit. To-day Glasgow stands as the best public-telephoned city in the kingdom.

It has a thousand national call office stations, which, according to the population, is equal to approximately one call office to every 760 inhabitants, and if we add the Post Office call offices it reduces the average to about one in 500.

In the Glasgow development the aim was to put a call office in every block in the busy parts of the city, and as a result the familiar yellow "Lion pattern" sign is conspicuous in almost every streetscape. They silently but very effectively publish abroad the fact that no matter how far one may be away from home or business, with the aid of the telephone service, "distance is naught."

In call office development the position or site is perhaps the most important consideration; the kind and class of shop, its position and location. It will be interesting to note Glasgow's selection.

19	per cent.	of	them	are in newsagents and stationers.
11	,,	,,	,,	tobacconists.
11	,,	,,	,,	dairies
7	,,	,,	,,	chemists.
6	,,	,,	,,	confectioners.
6	,,	,,	,,	railway stations.
6	,,	,,	,,	clubs halls, &c.
5	,,	,,	,,	hardware merchants.
4	,,	,,	,,	tea rooms.
4	,,	,,	,,	stationers and tobacconists (combined).
3	,,	,,	,,	bootmakers.
2	,,	,,	,,	fruiterers.
2	,,	,,	,,	drapers.
14	,,	,,	,,	bakers, grocers, cycle agents, hairdressers, etc., etc.

100 per cent.

It will be observed that the call office has a liking for the newsagents' shops. They head the list, having almost double the number of the next on the list, the tobacconist and dairy. It is perhaps not to be wondered at, seeing they are both in the line of business, the transmission of news, avenues of communication. Newsagents' shops are more numerous than perhaps any other kind. They are centres of a good deal of traffic, open for long hours, and frequently on Sunday, and there is nothing objectionable about them.

From the standpoint of the revenue, it is not easy to get at the best class of shop for the call office. There are so many things that might operate either for or against the drawings.

Taking the busier parts of the city, however, a study of the drawings shows that the call offices in large tea rooms and confectioners are good revenue earners; the former are likely to be largely used by business men. Tobacconists, newsagents, dairies, and chemists come next in order. These shops seem to stand in a category by themselves as revenue earners.

It is noticed also that the revenue from call offices fluctuates a great deal, according to the season of the year, state of trade, and important events of the day; but there are many other things that help or hinder the drawings. A call office is of little use without a sign. Some proprietors of shops object to the yellow sign, and a less conspicuous one has to be put up. Where these have ultimately been superseded by the yellow sign the drawings have gone up with a bound. Signs well placed inside the shop and lettering on the window are helpful, all serving to draw attention to the service.

Under the heading of advertising, mention might be made of the use of small cards, intimating to householders and others the proximity of a call office. I do not think householders are as yet fully alive to the advantages of the telephone service, even if they know of the presence of a call office in their locality. In such cases advertising by card has been followed by good results. I know of one call-office keeper, a stationer in a northern part of the city, who, in his zeal to reach the commission-paying standard, advertised his call office in the local newspaper for a considerable period, and in this way almost doubled his drawings. The only mistake he made, from our point of view, was that he sent in a claim for the cost of advertising.

Call offices in busy parts having silence cabinets naturally do better than those without such privacy. A very small proportion of the Glasgow call offices, however, have them, the floor space available in most shops prohibiting their use. Even a silence cabinet in a shop where there is not much coming and going of the public is little run upon. I have in mind several laundry receiving offices so supplied, and with the fact duly advertised outside, that draw much less than other call offices in the near vicinity with no cabinets.

If a call office is doing poorly a transfer to a new position may prove its salvation. A survey of the revenue before and after a few of these transfers reveals some useful facts. A poor call office in a chemist's shop in a main thoroughfare was removed to a stationer's shop three doors away, and doubled its revenue right away. A dairy call office removed to a stationer's shop on the opposite side of the street very soon trebled its drawings; a similar case in a burgh near Glasgow of a call office transferred from a draper's to a stationer's opposite doubled its revenue. The following case operates the other way:—A call office in a busy stationer's shop which was shut up was removed to a dairy a few doors away and the drawings dropped to a third of their former amount. There is also the case of a tobacconist's in which a call office was placed being converted into a draper's shop; the revenue fell to half the former amount. The call office was transferred to another tobacconist's a few doors away, and speedily recovered its old standard. I have in mind also a hairdresser's call office in a busy city arcade which only yields a return of about one-sixth of the amount of a restaurant call office in the same arcade.

All these instances bear witness to the fact that the call office revenue is proportionate to the traffic of people coming about it. In busy parts of the city the one call office in every block idea can safely be expanded. In such places call office collections are practically undiminished by installing others. A new demand is created by providing increased facilities. The call office seems to make its own traffic, its very presence suggesting its use. The more facilities for telephoning the more telephoning there will be

A few call offices installed as an experiment in the better class of Italian confectioner's shops have done well from the standpoint of the revenue, no doubt largely due to the long hours such shops are open. Call offices in small hotels, golf and other athletic clubs, halls and tenements have proved failures in Glasgow.

Much of the success of a shop call office depends upon the attendants. They are, after all, the educators of the public in the use of the telephone service, and a trying job they have many a time. Some callers, generally women, can or will do nothing for themselves. The number they want has to be looked up, change given, the call passed, and often the message has to be spoken for them. If the call office keeper is obliging, and many are naturally gifted that way, everything goes smoothly, otherwise the call may be lost. The bolder class of user make their first attempt themselves, and the trouble is then transferred to the operator. The public call office is often a source of worry and annoyance to the operator in attendance, on account of callers who will not use their common sense. They put in the penny before they call the exchange. They make frantic endeavours to speak into the earpiece of the hand set. They hang up the receiver while putting in the penny, and omit to turn the handle of the box. They use bent pennies, or they may ring up the exchange and then ask the operator to wait till they get change. A little more care and judgment and attention to the instructions would keep them right. Faults occur at call office stations perhaps more frequently than elsewhere on account of the rough usage they often get. Such treatment is bad for anything, but especially so for delicate electro-mechanical apparatus, and causes irregularities of working. The automatic box is perhaps the worst offending part, and most liable to lapses from regular working. Advantage is often taken of the fact by a not over-scrupulous section of the public. They want something for nothing, and the automatic box becomes the victim of irregular practices. It has even been reported that a vocal squeal has been resorted to in imitation of the buzzer signal.

The help and co-operation of the call office keeper is invaluable in checking such malpractices, and the best relations should exist between the Company and their body of unestablished servants.

Much can be done by the Company to help all concerned by placing the instrument in an accessible position, easily seen on entering the shop, in good light, with the directory and instructions at hand.

To sum up, the points to be noted are:

(1) The public call office is a means of popularising the telephone service.

(2) It effectively educates the public in regard to its rapidity and completeness.

(3) It induces the telephone habit.

(4) A properly developed call office system is a good source of revenue to the Company.

(5) In placing them the traffic of people is the main consideration. Increased facilities create new demand and act as a suggestion to use the service.

(6) The most profitable places are busy railway stations, large tea rooms, confectioners, tobacconists, newsagents and stationers, dairies and chemists.

(7) A uniform and conspicuous sign are essential.

(8) The instrument should be placed in an accessible position, in good light, kept thoroughly clean, and with the directory and instruction card at hand.

TICKET SORTING.

THE sorting of measured rate tickets offers a variety of method, particularly in connection with larger exchanges. At the one end you have that very direct method of having a pigeon-hole for each telephone number, and placing the tickets into their correct spaces in one process. At the other end graduation can be carried to absurd lengths, *e.g.*, an exchange with a range of 500 numbers might be sorted thus:

First stage into	5	bundles of	100	each.
Second	„	„	4	„	„	25	„
Third	„	„	5	„	„	5	„
Fourth	„	„	5	„	„	1	„

The time taken by different methods varies considerably. In tests of a wide variety of methods—all of them reasonably likely—the quickest method has proved to be as much as 25 per cent. or 30 per cent. superior to the slowest.

An exchange with a range of 5,000 numbers has given the following results:—

METHOD.

STAGES. First.	Second.	Third.	Fourth.	Tickets handled per clerk-hour. (Entire sorting.)
300's	20's	Units	...	 919
500's	20's	Units	...	 1,042
200's	20's	Units	...	(First trial) 1,084
400's	20's	Units	...	(Best of several) 1,086
500's	100's	10's	Units	 1,120
1000's	100's	10's	Units	 1,120
200's	20's	Units	...	(Further trial) 1,200

The last method has been taken as the correct one to use. To make it quite clear, the stages of this method are:

First.—The 5,000 numbers are sorted into 25 bundles, representing 200 numbers each.

Second.—Each of these bundles is sorted into ten bundles, representing twenty numbers each.

Third.—Each of these bundles is sorted into units.

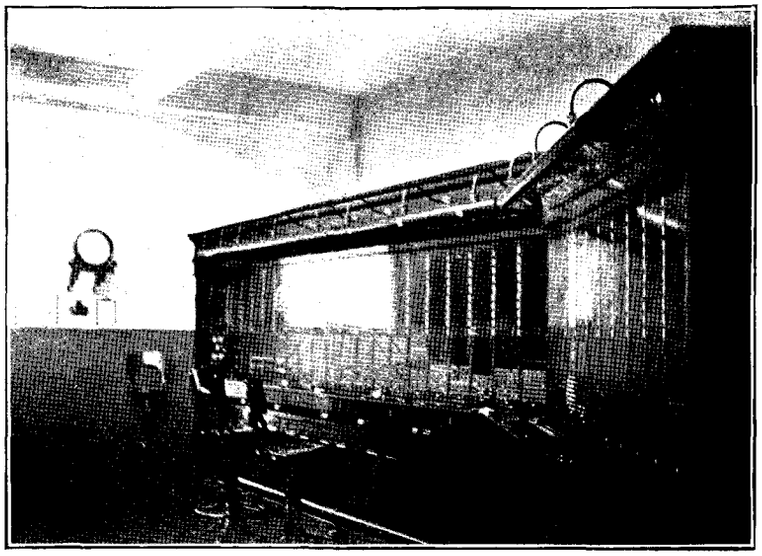
It seems clear that there is a law governing these results, and in order to stimulate consideration of the matter throughout the country the following is suggested as a rule for fixing the method which will give maximum output:—

Range of numbers.	STAGES. 1	2	3	4
(*a*) 1 to 35	Units	...	...	...
(*b*) 36 „ 80	10's	Units	...	...
(*c*) 81 „ 600	20's	Units	...	...
(*d*) 601 „ 800	100's	10's	Units	...
(*e*) 801 „ 6,000	200's	20's	Units	...
(*f*) 6,001 „ 8,000	1,000's	100's	10's	Units

A FEW NOTES ON CAMBRIDGE CENTRAL BATTERY EXCHANGE.

BY H. J. HERINK, *Chief Inspector*, AND A. J. COULSON, *Test Clerk*, *Cambridge*.

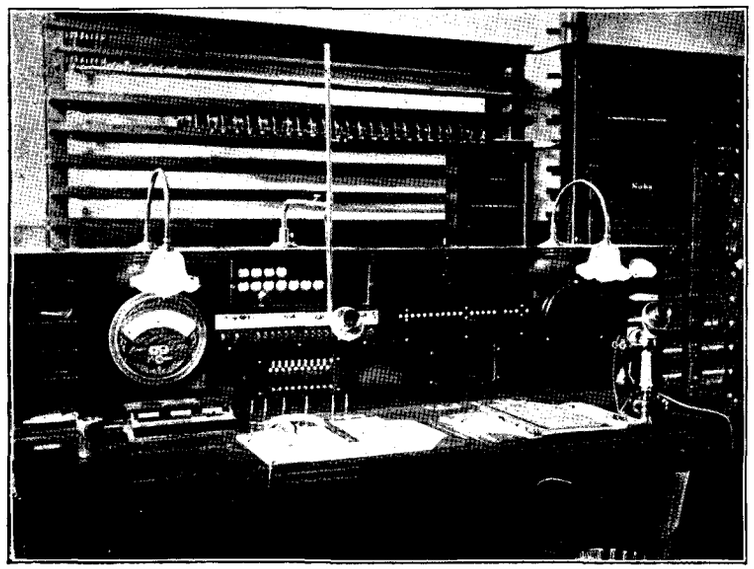
THE above exchange has recently been opened to replace an old magneto system, and it is thought that a few photographs will be acceptable to the readers of the JOURNAL.



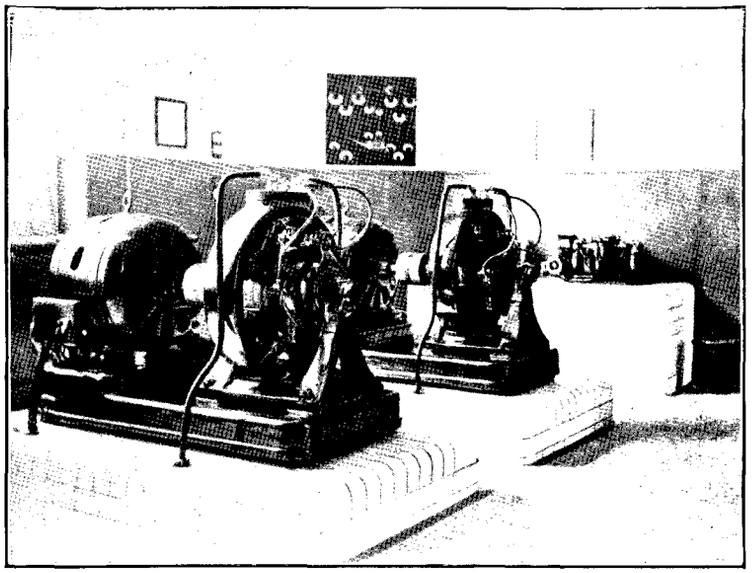
SWITCHROOM.

The building was specially built on a site previously occupied by five cottages and adjoins the Young Men's Christian Association. The switchboard is equipped for 900 subscribers' lines and 27 incoming junctions, and is of the No. 1 type. The ultimate capacity is 3,300. The battery consists of eleven cells of the C type, having a capacity of 900 ampere hours, and four cells of the S type, with a capacity of 180 ampere hours. The power plant consists of two motor generators and two ringers. The motors are of the Wagner type with a horse-power of 5½, speed 1,750, single phase 200 volts, and 90 ~. The generators are of the No. 3 type.

The opening took place on Jan. 16 of this year, and owing to the fact that the "B" lines were earthed on the old system the cross connections on the main frame were reversed, so that the earth return was through the A spring of the cut-off relay. On the fitting of the new instruments the jumpers were again reversed into the correct order. The change from an old earth-circuit system to the present one is greatly appreciated by the subscribers of Cambridge, and the new system hes been responsible for the comparatively large increase in private branch exchanges.



TEST CLERK'S DESK, SHOWING REPEATER.



POWER PLANT.

REPEATING COILS.

BY G. H. BRYANT, *Metropolitan Electrician's Department*.

(*Concluded from page* 169.)

The 25*a* repeater has an unbroken circular coil of iron wire (about No. 22 gauge) on which are wound four separate windings of 22·5 ohms each, completely hiding the core from view, see Fig. 6. The two "A" line portions of the coil are wound on one half and the two "B" line portions on the other, see Fig. 10. This

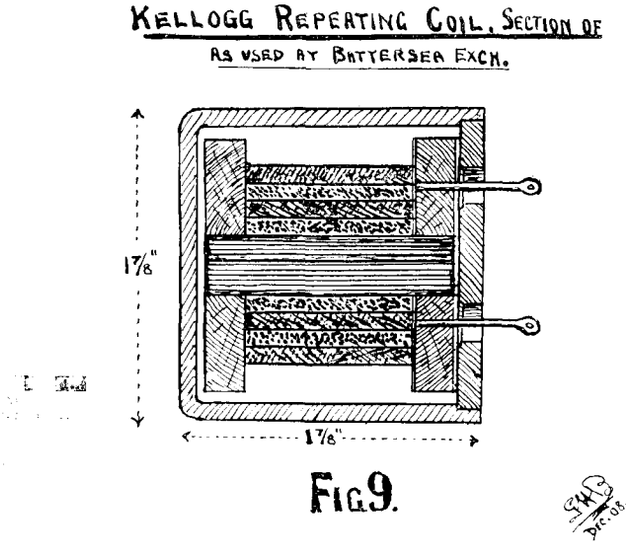


FIG 9.

point must be borne in mind when considering the core magnetisation. The maker's diagram attached to the coils unless carefully examined gives one the idea that the four windings are arranged in quadrant fashion. The coil is mounted on a wooden base and covered by an iron shell filled with resin, which has a habit of finding its way to the floor if a short circuit occurs for any length of time. This repeater is stated to be the most efficient yet

designed, and superior to the older types to the extent of nearly two miles of standard cable.

As previously mentioned the Kellogg repeater is of interest owing to its puniness, see Fig. 9. It is practically a shell transformer; there are four windings, about 20 ohms each, and the eight ends are connected to terminals, as shown, which project through holes in the iron end-plate. As in the case of the No. 13 repeater there is only one way of joining this up to make it inductive.

No 25A Repeater Magnetisation

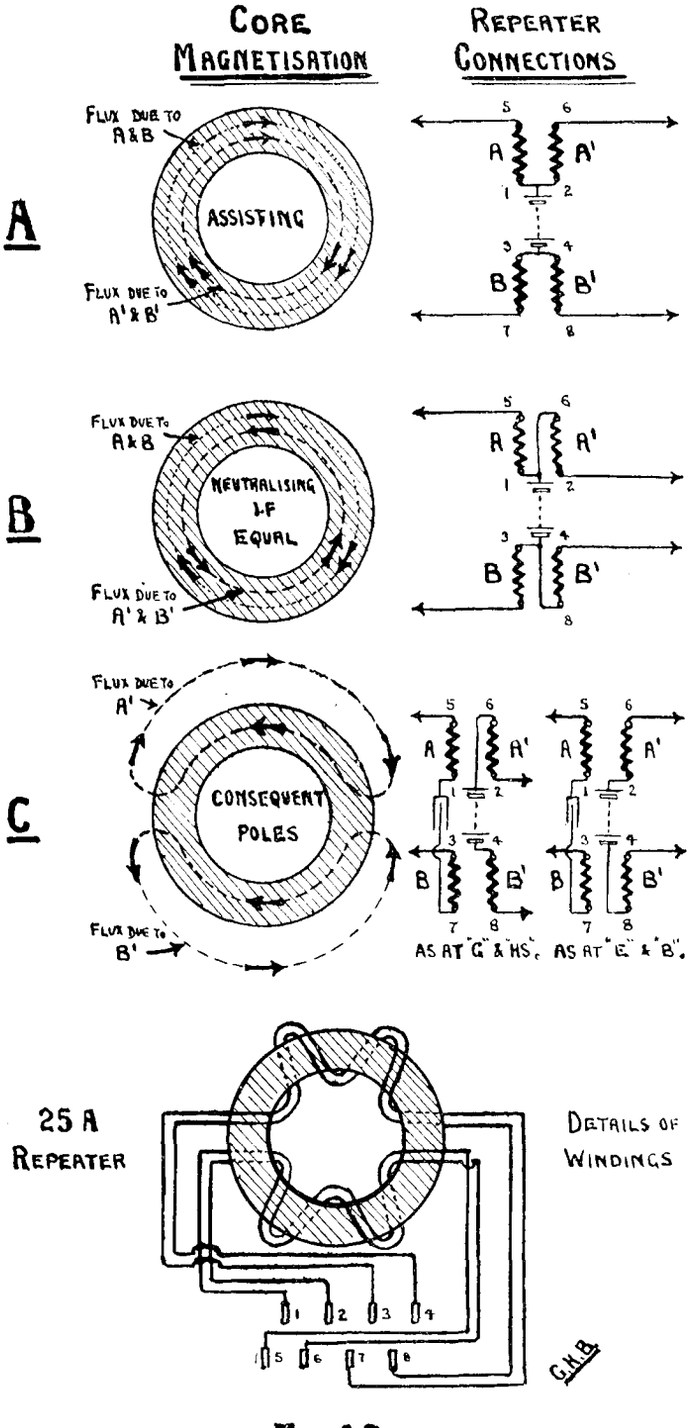


FIG. 10.

A consideration of the effect of the different methods of connecting repeaters is of interest, and it is generally stated to be advantageous to have the core not magnetised during conversation, that is with the two sides of the repeater acting in opposition, see Figs. 10*b* and 12*b*, providing the main battery leads are short and heavy and the internal resistance of the battery is low. With the non-magnetised condition it would seem that the portion of the B and H curve below the knee is being worked on, and therefore a greater change in the flux would take place, and consequently an increased inductive effect for a given change in the current flow, than if the core were magnetised, see Figs. 10*a* and 12*a*.

I notice, however, that the 25*a* coils on "A" positions at London exchanges are always magnetised during conversation, whether connecting subscribers of equal line resistance or not, and it seems to me that we are not getting all we might do out of this type of coil.

The magnetisation of the Nos. 11, 12, 13 and 25 repeaters under working conditions can be considered from Figs. 10 and 12, where the resulting magnetisation of the core for the four different methods of connecting is shown. Case A is where all four windings act in unison and send the flux in one direction, as in the case of the No. 25 coil in "A" positions before mentioned.

Case B is where the two windings relating to one side of the circuit—that is to say, a winding in each section of the repeater either No. 11 or 25 type—are reversed, and therefore tend to send a flux round the magnetic circuit in the opposite direction to the other pair of windings, resulting in a neutralisation of the fluxes if the two

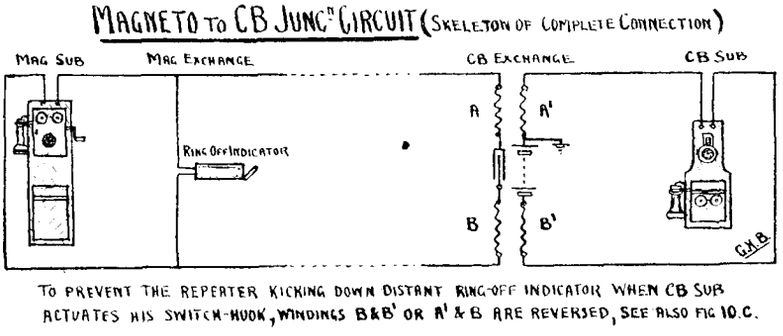


FIG. 11.

external circuits of the repeater are equal. The No. 11 coil as supplied can only be connected this way, because there are only six terminals.

Case C is for incoming circuits from magneto exchanges, and unless worked in this manner on these circuits the repeater will kick (*i.e.*, have a comparatively heavy current induced on the other side) when the central battery subscriber lifts his receiver off the hook, and so drop the ring-off indicator at the distant magneto exchange. To get this consequent pole effect the magnetisation (there are two methods, as shown) of one of the windings on each side of the repeater is reversed, and consequently the two opposing fluxes thus set up stream out of the core at the points where the consequent poles occur and complete their circuits through air. Thereby, owing to the increased reluctance of the magnetic circuit, the total flux is considerably reduced. The result is that when the central battery subscriber lifts his receiver off the hook and a flux is created about the repeater core, the electro-motive force that is generated in the magneto exchange side of the circuit is not sufficient to affect the distant ring-off indicator. The induced electro-motive force is directly proportioned to the flux as the rate of cutting is constant. A skeleton of the complete circuit magneto to central battery is shown in Fig. 11. The very small current flowing through the distant ring-off indicator due to the 12,000-ohm relay—omitted in sketch—does not affect the kick of the repeater. The iron cover of the 25 type coil being open on the under side does not confine the external field under this consequent pole condition of working, and overhearing or cross talk between junction circuits results.

Faults on repeaters apart from troubles on the tabs are not of frequent occurrence; contacts between the windings are easy to

locate, but complete or partial short circuiting of one winding or internal disarrangements are more difficult to handle. It sometimes happens that the internal connections of the coils get altered and joined up incorrectly during repair. A very handy and convenient method of proving whether a repeater is fully or partially short circuited in one of the windings, or joined up incorrectly internally, is to connect one side to the busy-back after the external connections have been proved "O.K.," and then to listen with a receiver on each winding separately, not across each line, and if the tone is

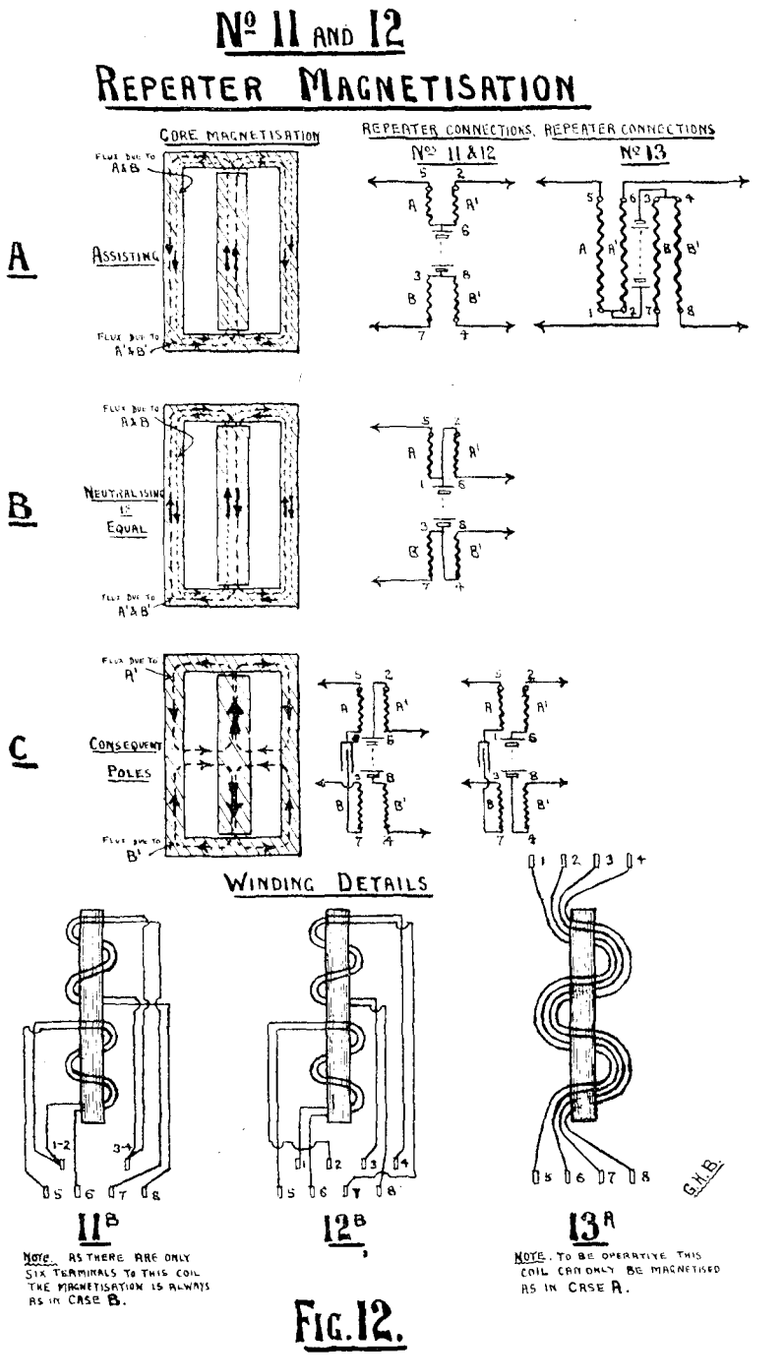


FIG. 12.

heard equally well in each case neither winding ispartially or fully short circuited. In a case of the latter fault the tone would not be heard at all, and in the former it would be dimmed. Where the circuit of a coil appears to be "O.K.," and yet cannot be spoken through, the trouble would be due in all probability to two of the windings opposing each other, and consequently neutralising, so that the external effect is *nil*. In this case we must secure the receiver on the line terminals farthest from the busy-back, and proceed to momentarily short circuit each winding in turn. If one winding is reversed the tone will be heard when any one of the four windings is short circuited, but will be loudest when either of the two opposing windings are short circuited. Which of the windings to reverse to right the trouble will depend upon whether it is required that the core shall be magnetised or not during conversation, but altering either would make the speaking "O.K."

BRISTOL OPERATORS' TELEPHONE SOCIETY.

THE following are extracts from papers read before this society on Oct. 14 last:—

"COURTESY." By Enid Gardner.

The fact of courtesy being such an important quality will, I am sure, excuse continuous reference to it, for it is one step on the way to obtaining the confidence of our subscribers. Courtesy is needed to a large degree by our contract staff, but when the subscriber is secured it is on the operating staff that the duty of fulfilling expectation falls. One will forgive almost any neglect if it be explained in a courteous manner. Our subscribers become so accustomed to looking upon the operator as a mere machine that it is only when some lack of courtesy occurs that they realise the value of the quality lost and feel quite personally aggrieved.

The spirit of healthy rivalry has been greatly developed by the adoption of team work. This has been of great advantage for it evokes enthusiasm; yet this too can easily be abused by the absence of courtesy.

The switchroom is an excellent place to school a character. At all times we have to exercise a perfect control over ourselves and our words, and what better training place can be had than where this control is always in full play.

Operators must be courteous also amongst themselves. Lack of courtesy brings discontent, and if an operator becomes discontented she will surely show it by her manner. Nothing is more trying than to sit next a discontented operator; on the other hand, in a switchroom where each is polite and a general spirit of brightness pervades the place the effect on ourselves and our work is good.

Over the line the tone of voice is a great factor; rudeness is often implied by tone. A polite answer spoken sharply shows the absence of the spirit of courtesy.

Between our sub-exchange staffs and the central confidence and courtesy should be cultivated. Away from the central our staff have not the advantage of instant reference to a supervisor; if the central exchange operator be curt or abrupt and the sub-exchange operator a little sensitive there will be an absence of that fullest confidence necessary for the complete harmony which adds so much to the happiness and efficiency of our staff.

"INTELLIGENCE." By Elsie Hunt.

This is one of the most necessary qualities of the switchroom staff. Intelligence teaches us to make the best possible use of common sense. The intelligent operator is the one who feels she was made for success and happiness and realises that it is the happy, buoyant and cheerful attitude of mind that wins; she tries to understand those by whom she is surrounded. Junior operators are guided by their senior, and if the senior be broadminded and intelligent her team will be the same.

Different people have different ways of looking at things, but the broad view of an intelligent person is always appreciated.

To be successful in life one must be intelligent, and undoubtedly the possession of this virtue greatly adds to one's happiness. If operators in the midst of difficulties would only exercise a little self-restraint and patience, most of our switchboard troubles would vanish. We *must* work together for a time, and whether we shall be comfortable and happy or not will depend upon the way in which we treat those with whom we have to live.

"ENTHUSIASM." By May Russett.

By enthusiasm I do not mean a sudden flame followed by a dying ember, but the feeling that it is evinced by a genuine liking for one's occupation. We all know that enthusiasm is one of the operative causes which form character and control conduct.

In my opinion the wages (or may I dignify it with the name of salary) paid to an operator who is not enthusiastic is a bad investment, in so far that she does not give the expected returns. There is a liability to slothful and careless work and it needs very little explanation to see the harm such a person would soon cause to any business. On the other hand the girl who is enthusiastic understands the value of the telephone service and does all she can to make it better known. There are ways other than talking of it to advertise our telephone service.

We know that enthusiasm begets attentiveness and when work of any kind is given a proper amount of attention it is certain by the common law of cause and effect to be a success.

There is a way in which the attentive operator speaks which has a confident ring about it. Our work is not monotonous, every subscriber has a different voice to be studied and must be answered in accordance with the asking. There is really nothing dull about operating, it cannot be so if we only give our mind to the interesting side of the work.

This last sentence conveys exactly what I mean by enthusiastic operating, the girl who thinks and works in that spirit will make each subscriber feel he is receiving her particular attention, and this is a feeling we try to foster in our telephone users, for after all it is only a human failing to like to feel that we merit special care.

One of the surest ways of destroying this feeling is by a little inattention. If a subscriber gets much of this, such as careless ringing, he becomes more or less like a cruet stand, whenever you go to him you are sure of getting something either hot, strong or sharp.

Enthusiasm is also very infectious. It is far more easy to work next a girl who does her duty in a bright interested and energetic way. It heartens her companions and they involuntarily follow her example. Her value as an influence cannot be reckoned.

On visiting our sub-exchanges I was very much struck by the necessity for unison between them and the central. We must all work together to make for success. We know that unity is strength, and if every girl gives her work attention and is enthusiastic about it, I see no reason why we should not make a perfect whole.

TELEPHONE WOMEN.

LIII.—ELIZABETH EMILY WESTLAKE.

ELIZABETH EMILY WESTLAKE, Clerk-in-Charge, Plymouth, who was born at Plymouth on Nov. 17, 1877, entered the service on May 4, 1906, to train as clerk-in-charge for the Plymouth Exchange, having previously been employed in a local business establishment.

Although she had no previous experience in telephone operating work, Miss Westlake was so successful in picking up a knowledge of the duties that she was appointed Clerk-in-Charge of Plymouth Exchange on July 13, 1906. The fact that she is able to control

ELIZABETH EMILY WESTLAKE.

satisfactorily an exchange of this size proves that she took full advantage of the opportunities offered while in training under the switchroom managers at Bristol and Cardiff for noting the methods adopted for dealing successfully with an exchange such as Plymouth.

Her career has been uneventful, but her duties are carried out quietly and conscientiously, and with the respect of all her staff. She has now control of nine exchanges and nineteen operators. Her principal interests outside business are music and reading.

LIV.—ELIZABETH DOROTHY DAVY.

ELIZABETH DOROTHY DAVY, Supervisor, Plymouth, entered the Company's service as a junior operator in April, 1895, at the Manchester Central Exchange, which was then situated in the Royal Exchange Buildings. After a short course of training she was transferred to the Docks Exchange, which then consisted of a small wooden hut, approximately the size of a bathing machine, and ten subscribers. Three years were spent at this exchange, and when she was transferred back to the Central there were 200 subscribers, an increase of 190 in three years.

During the three years she spent away from the Central Exchange the National Telephone Company had taken over the Mutual Telephone Company and removed its offices to 102, Port-

ELIZABETH DOROTHY DAVY.

land Street, replacing the upright switchboard system by a flat multiple system with call-wire working, the call-wire operators taking 60 lines per call wire. Owing to the removal of Miss Davy's parents to Plymouth she was transferred as Senior Operator to Plymouth Exchange, a position she held until she was appointed Supervisor in May, 1907. She has served under three district managers and three clerks-in-charge, and has considerable experience with varying types of boards. Miss Davy carries out her duties with a critical eye, which every supervisor should cultivate, and with tact and firmness.

NATIONAL TELEPHONE PROGRESS.

A NEW exchange has been opened at Laceby (Lincolnshire), in the Hull district. During October there was a net increase of 2,352 stations, making a total of 497,153.

Aberdeen.—On Nov. 13 the Aberdeen subscribers connected to the Central, Kittybrewster and Western Exchanges were transferred to the new central battery No. 1 equipment for 3,220 lines, which has been installed in a new building specially designed for a telephone exchange.

Bristol.—The work in connection with the underground extension recently sanctioned by Head Office is proceeding fairly briskly. Up to the present 370 yards of pipes have been laid in six different parts of Bristol; 3,648 yards of various sizes of cables have been drawn in—a large portion of it over existing cables. The jointing of the same is now being proceeded with. About 50 miles of spare wire have already been picked up and jointed into the new cables.

THE NATIONAL TELEPHONE STAFF BENEVOLENT SOCIETY, LONDON.

The following grants were made during the month of October:—

Engineers' Department (three)	£8 17 3
Traffic Department (one)	5 0 0
Head Office (one)	4 0 0

Total number of grants made since formation of society—210, value £638 14s. 10d.

Donations received: £7 19s. 7d.

Number of members at Oct. 31, 2,765.

INSTITUTION OF ELECTRICAL ENGINEERS, MANCHESTER SECTION.

ON Nov. 17 Mr. L. E. Wilson read a paper on "Telephones," from which we quote some extracts:

Twenty-one years ago, when Manchester was not connected telephonically with London, and pioneers were busy anticipating the difficulties of communication owing to the process of inter-switching, etc., there were 1,400 subscribers here and about 5,000 subscribers in the Metropolis. A night service was inaugurated in London about this time, but with indifferent success, and from ten o'clock at night until six o'clock in the morning there were only 40 calls per week, and it was estimated that each one cost 10s. Now at the present time some 18,600 calls are originated on the National Telephone Company's system in London nightly, between 8 p.m. and 8 a.m, and the 103,287 exchange stations as at Jan. 1 this year originate 590,000 calls per day. In Manchester the number of exchange stations have increased to 20,000, giving 138,000 calls per day.

I will not attempt to describe the study and methods involved in constructing and reconstructing a telephone exchange, but will proceed with the commercial considerations connected with the handling of calls. All will recognise that speed is essentially the telephone engineer's maxim, and a few seconds saved on each call approaches gigantic proportions in the aggregate; consequently even the expressions employed by the operators are regulated, and co-operation, or team work as it is called, is now used extensively, and reacts favourably on the service. An example of the wastage in words, no doubt fresh in the memory of not a few, existed in the local custom of saying "Right" after repeating a demand for a number. When this practice was discontiuued the improvement was soon appreciated, as the saving effected by omitting 100,000 unnecessary words per day is not the only feature involved.

In spite of the strides made full advantage is not yet taken by the public of all the facilities a telephone service offers, and this is not due to any technical difficulties. In some quarters discrimination is exercised as to the nature of the business involved before the telephone conversation is permitted, with the erroneous idea of reserving the telephone for more important business. The policy of preventing people reaching a correspondent quickly and freely is no more justified than leaving an accumulation of letters unopened and unanswered. It happens, however, that this indispensable means of communication is not only starved and undeveloped, but occasions much annoyance. A tendency to stagnation and disregard is very noticeable in other respects, but improvements are making headway, although the educational process is a very slow one.

The telephone service is the most rapid, cheapest, and most direct channel for information, and this channel should be open both ways, and the intelligent study of the best method of handling telephone calls is of wide importance; as a rule the subscriber is only alive to the delay *he* actually experiences, and is not interested in any irregularity occasioned by his own methods. It is very unlikely that any business concern would willingly carry out work of an unproductive and ineffective character, and yet a large percentage of calls are rendered so through many preventable causes. One of the characteristics in Manchester telephone traffic is the sudden stoppage of work for lunch. Many business houses practically suspend business or even close their doors during this period. The subscriber in London, not aware of this peculiarity, attempts to effect communication at the time, only to be told "No reply," and it may also be remarked that the interruption to business every Whit-week in Manchester is telephonically a calamity. The difficulty in catering for the spasmodic traffic of this description is very great, and considerable foresight is necessary to properly regulate the operating staff's duties to meet the demand.

* * * * *

Turning to apparatus intended for domestic or private use, Mr. Wilson gave an analysis of faults, taken over a long period and a large number of instruments, and given in relative order of importance.

1. *Wiring.*—Much trouble can be traced to the practice of leaving at each terminal a spare length of wire in the form of a helix which is easily broken. The wire should be stapled direct to the terminals. Faulty design and the placing of cotton-covered wire in unsuitable positions or in steel conduit where moisture and condensation in time break down the insulation.

2. *Primary Batteries.*—The life of a battery varies according to circumstances, but they are often needlessly changed. The correct way to test is to leave the receiver off the hook for at least five minutes before making the necessary observations.

3. *Bell Troubles.*—After being adjusted correctly, the chief trouble is caused by cleaning gongs. Intermittent faults in the coils often due to acids used in the manufacture of the bobbin fibre end, it is a difficult fault to localise even with a weak current. A generator circuit will oftentimes overcome the interruption to the circuit.

4. *Instrument Cords.*—The cord represents the weakest part of any system, and is known as the telephone man's scourge. It is, therefore, wise to reduce the cords to a minimum, for this reason the hand combination instrument is really the most inefficient and consequently the most expensive instrument to maintain. Its popularity is due to the convenience offered.

5. *Transmitters.*—Damage by pencils and the packing of granulated carbon. These troubles are largely overcome by the use of the solid back microphone chamber with perforated mouthpiece.

6. *Generators.*—Cut-out troubles. Short-circuiting the generator due to breakdown of insulating pin, oil and metallic dust is generally responsible, especially in certain tpyes of instruments where the frame is used as a common connection.

7. *Receiver.*—Represents the first telephonic apparatus invented, and left the hands of the inventor in an almost perfect condition; it offers very little scope for improvement. The change from bar to horseshoe magnets is perhaps the most important. A diaphragm too close to the magnet is a trouble which can be ascertained by the sound emitted when flicked with the finger, the sound should be hollow. Freedom from dirt is essential.

8. *Lightning Arrestor.*—Generally of the serrated type open and exposed to dust and foreign matter, which causes short circuits. Terminals left exposed to the atmosphere will, in a short time, cause trouble.

9. Fixing instrument to damp walls introduces various trouble.

10. *Cradle Switch.*—Such causes as poor springs and contacts, and the accumulation of dirt interfere with the regular working of some types of instrument switch hooks.

"ELECTRICAL ENGINEERING."

A MONTHLY MINING SUPPLEMENT.

WE notice a new departure by our contemporary, *Electrical Engineering*, in the issue of a monthly supplement devoted to electrical engineering in mines.

The first number, issued on Nov. 4, contains articles representative of several phases of mining work. To telephone men the short article describing a new telephone set for intercommunication between two points in a mine will be of interest.

Other articles include a well illustrated one dealing in a practical manner with the installation and maintenance of cables in mine shafts and galleries.

THE NATIONAL TELEPHONE STAFF TRANSFER ASSOCIATION.

A PAMPHLET has been prepared by the central committee setting out as concisely as possible the present position of the staff in relation to the transfer, and is being issued to members of the staff through the association's local committees. If, through any oversight, any member of the staff does not receive a copy, will he kindly apply to the secretary of the local committee for his district.—ERNEST A. C. SANDY, Principal Secretary.

DEATH OF MR. BUNNIK.

WE regret, as we go to press, to hear of the death of Heer Harmannus Eizo Bunnik, Director of the Municipal Telephone System of The Hague.

The National Telephone Journal.

"BY THE STAFF FOR THE STAFF."

Published Monthly at
TELEPHONE HOUSE, VICTORIA EMBANKMENT LONDON, E.C.

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VOL. IV.] DECEMBER, 1909. [No. 45.

THE TRAFFIC MANAGER AS SALESMAN.

THE introduction of the measured rate service and its gradual expansion up to now, when the traffic arising from it bids fair to exceed in volume that of the flat rate service, introduces a new phase of the traffic question which requires careful consideration. Under the older system it was to the advantage of a telephone administration that the subscriber should use his telephone as little as possible in order to reduce the expense of operating. The administration earned no more whether he sent much or little traffic over his line. In the case of a measured rate subscriber, however, there is obviously every reason that he should be induced to use his line as much as possible; for, of course, the more he uses it by so much the more will the revenue of the administration be augmented.

Some time since the Company appointed in the larger districts traffic managers whose particular care it is, among other duties, to watch over the quality of the service. As has been remarked elsewhere telephone calls represent essentially the commodity which the Company is selling to the public. According to the ordinary axioms of salesmanship, upon the excellence and judicious advertisement of a commodity depend the extent of its sale. It is a point not to be lost sight of by traffic managers that, besides maintaining the *quality* of the service rendered, it comes immediately within their province to increase the *quantity* sold; in other words, to encourage the subscriber to make the fullest use of his telephone. The plant which the Company provides bears the same amount of interest on capital and, practically, of depreciation whether it is busy or idle. Now whether a line is busy or not depends to some extent on the inducements offered to the subscriber to use it frequently. The traffic manager knows as no other man the needs of his subscriber, and the wants of his district. He is able by increasing the facilities afforded by the service to increase the sale of calls. In the first place the promptness and smoothness of the service is its chief recommendation; on this will depend largely the subscribers frequency of user. In the second, the subscriber must be able to obtain telephonic communication with the party he wants. The traffic manager is in a position to know what lines are habitually overloaded, what business house is insufficiently telephoned, what railway station has no line to this or that department, what important firm, often asked for, is not connected to the exchange. He is able to put the contract office on the right track, and the benefit to the departments is mutual. First and foremost his duty is to encourage traffic, and by no method is this done more readily than by the provision of a quick, reliable service and by the expansion of the circle which a subscriber can reach. Many a tedious letter and many a troublesome call would be avoided, to the benefit of the subscriber and to the profit of the Company, if the telephone could be properly taken advantage of. Thus the traffic manager is concerned with salesmanship in no indirect manner, and his department should constitute a most important adjunct to that of which the primary duty is to secure business. Exchange managers no less can play a great part in the creation of new business, and, indeed, it is difficult to say what section of the staff does not, by contributing its quota to the greater efficiency of the service, further the acquisition of new business.

TELEPHONE TRAFFIC SOCIETIES.

FOLLOWING upon the establishment of successful operators' telephone societies at Swansea, Bristol and other places, the traffic branch formed in connection with the London Telephone Society extends this interesting and educational work to the thousands of operators employed in the various Metropolitan exchanges.

We cannot express too strongly our belief in the benefit of these societies, nor recommend too warmly those of the operating staff who have not yet attended their meetings or taken part in their debates to do so. Besides the combining of mutual interests and the promotion of fellowship between the members of scattered exchanges, they offer much in the direction of a true comprehension of the daily task and of explanation of the hard, fast, and often misapprehended routine under which operators work. Knowledge is obtained which gives a meaning to regulations and systems hitherto without interest and this because they were not understood.

In all large concerns such as The National Telephone Company there is always engaged in routine work, sometimes monotonous and sometimes exacting, an enormous body of the rank and file who rarely, if ever, come into touch with the governing authorities, and over whose heads rules and regulations pass, systems are introduced, amended or changed, and all kinds of alterations carried out; but as to the reasons for these changes and alterations the staff are, of necessity, to a very large degree in complete darkness. It is the duty of a staff to carry out these rules and alterations loyally, and although this may be done, it is not in human nature not to grumble at and criticise unofficially new regulations the reasons for which are not apparent. There is thus apt to be engendered in the majority of the rank and file a lack of interest in work carried out under such conditions; they do not grasp the significance of all the important and radical alterations in rules and systems which may from time to time be made by what appears to them as a far distant and seemingly unapproachable

governing body. It is therefore, perhaps, not surprising that the enthusiasts consist of a minority possessed of unquestioning faith in the system under which they work, whilst the majority, although performing their task satisfactorily, do so without enthusiasm, mechanically and with a blind acquiescence in a system which they feel they can never hope to influence, vary or amend.

It is here that a traffic society comes in. The operator of the rank and file can listen to papers and addresses, not only by her fellows and by those immediately above her—the supervisors and clerks-in-charge, but also by the higher officials of the Company; to papers explaining the hitherto unknown or misunderstood, and to remarks giving glimpses of policy, and placing the operator's outlook on the telephone world on an infinitely wider basis. She will be enabled to understand how the administrative machine works, and what careful thought and expert knowledge are brought to bear upon even the slightest change which is carried out. She will also be able to voice her views in the ensuing discussions, and if she has anything of value to say she may be assured that it will not fail to receive full consideration. A new interest will be given to her work, it will be more enjoyable, and though governed by routine it will no longer be mechanical.

It is therefore most desirable that the societies' meetings should be attended not only by the already enthusiastic, whose good work leavens the whole lump and sets the standard of efficiency in an exchange, but also by those to whom, although hard workers, the manysidedness of their occupation has never appealed. They would then speedily join the ranks of the enthusiastic; they would take a warmer interest in the great system of which they are such important units; and they would find that a warmer interest than they perhaps suspect is taken in them, and that the close study of their work and needs is a factor which has always to be considered by the heads of the Company.

HIC ET UBIQUE.

WE publish yet another letter from a member of the staff who seemed to have been much impressed with the automatic telephone system. We do not doubt the efficacy of this system so far as it goes nor that great improvements have been made in it. Further, we believe that there is a great field for it, worked by an expert operator, as an adjunct to the manual service. What we do not believe in is its expediency for large public systems. Mr. Clay whose knowledge of the London subscriber ought to be, like Sam Weller's knowledge of London, "extensive and peculiar," put the matter very shortly to the traffic meeting recently. He said that he could not conceive a subscriber going to the trouble of doing the operating himself whilst under the present system he had only to place the receiver to his ear, give in a number and the operator did the rest.

ACCORDING to the *Daily Express*, Mme. Sarah Bernhardt is being disciplined by the Post Office Department. Her telephone has been removed because she lost her temper a few days ago.

"Now," she is reported to have said, "they have taken the telephone away from me, and I shall never be allowed to use it again. I think I managed to be pretty rude, but I was not nearly as rude as I could have been.

"I feel like a woman with one arm. I used the telephone a hundred times a day, and because I lost my temper I have lost the principal convenience of my life."

We can offer no comment. We know that the Paris service is unspeakably bad; but what things the divine Sarah said in her wrath to merit her punishment we are ignorant of.

THE formation of new telephone societies still proceeds. Now that nearly all the district offices possess them, they are springing up in the local offices. Amongst the new ones this year we notice Torquay, North-East London, Paisley, Bournemouth and Weymouth.

A CASE is reported from Edinburgh of a canvasser whose linguistic capabilities stood him in good stead. He was interviewing the new tenants of a vacant house, and the interview was not going well, for the lady and gentleman, who were newly home from South America, began to discuss *pros* and *cons*, mostly *cons*, in Spanish. This was the canvasser's opportunity; he was able to convince them by argument in Spanish, and his reward is now in the district office in the shape of a flat rate agreement.

THE district manager who forwards it describes the following recognition of his efforts as an "oasis in the desert":—

"Dear Sir,—Allow me to thank you for your kindness in personally superintending the fault in my telephone service. I fully realise the unthankful position that you are at times placed in and express my great admiration of the man who can at such times keep cool and find time to hear all the petty grievances of the multitude who never think of what their little may mean added on to the burden already being carried.

"Again thanking you for your consideration and promptness."

"UNUSED TELEPHONE BOOKS."

["PEOPLE keep telephone books, but they never enter anything in them; at least that is what one is constantly hearing in this Court," remarked his Honour during the hearing of a case which raised the question of a telephone message." — *Islington Daily Gazette.*]

When to check the extent and the ways
Of a telephone company's sins
The doubting subscriber essays,
To keep a small book he begins.
It is ruled in fair columns; each call
You carefully note as you make it;
A process so simple that all
With lightest of hearts undertake it.

Yes, Principal Brown makes a note
Of his cails (or tells somebody else to,
And the chance is, of course, quite remote
That that person forgets whom he tells to).
And Jones, the chief clerk, won't omit
To record all his chats on those pages,
Nor the Typist her talks about . . . hats
With the friend whom "she's not seen for ages."

And the virginal white of the leaves
Of that telephone call-book is blackened
(Or should be) with figures in sheaves
If zeal to record has not slackened.
And when the official account
(Remorsely read from a meter)
Comes in, they'll compare the amount
With the book; and what check could be neater?

"Bring the book," and, expectant of sport,
Brown cries: "Now to bowl out or stump any
Disgraceful attempts to extort
On the part of that Telephone Company."
. . . But what horrid lacunæ! What gaps!
What paper unspotted, immaculate!
No entries for days—weeks, perhaps!
Imagine what Brown will ejaculate!

Envoi.

Subscriber, inclined to begin them,
O put not your faith in those ghost books
Which "never have anything in them,"
Or else very little—like most books.—W. H. G.

EDUCATION OF THE TECHNICAL STAFF.

By P. T. Wood.

In a many-sided business like that of a telephone company the education of the *personnel* in the various departments is of the utmost importance, no member of the staff being exempt from the responsibility of fitting himself for his position whatever that may be. Nor will this education be adequate if only good enough to enable the man to keep his present billet. It is a true saying: "The man that never does anything more than he gets paid for never gets paid for anything more than he does," and neither advancement or self-satisfaction lie that way. It would appear that the necessity for a knowledge of anything outside the ordinary daily routine is not recognised, many overlooking the fact that most things will be eventually useful though not immediately convertible.

Not unknown to us are those members of the staff who, because they get through their daily work without incurring reprimand, think that they therefore are doing all that can be expected of them. The punctuality of their arrival is above reproach and is equalled only by that of their departure; and in such observances of the law they are satisfied. Are they right? Probably not! Better things *will* be expected of them at some time, and promotion with increased opportunities of usefulness will depend upon the proof given of their competence to undertake greater responsibility. Our Company so keenly realise the importance of this matter that the staff is given special facilities in the way of obtaining useful knowledge. I do not at the moment refer to such a scheme as the Traffic Department's operating school, but to Correspondence Classes, polytechnic and institute classes, and local society lectures on topical subjects, which are all offered for the benefit of those willing to profit. The number of those taking advantage of this opportunity for learning details of their own or kindred subjects is no doubt large, and a proof of the interest taken by the staff in their work. To what extent a man's work is improved by his taking a more intelligent interest in it, is difficult to say, but there can be no question that class work has made many men keen, and more than anything else fitted them for promotion. If it were not for such cases one would wonder if the Company gets a fair return for the money expended in class fees.

I propose to indicate in this paper what, in my opinion, study should do for a man. It is imperative that students should have a clear conception of the purpose of study, as that conception will affect the choice of the subjects taken. I suppose all voluntary study is undertaken with a view to the acquisition of knowledge, either of a general or of a particular nature. The classes mentioned previously are primarily intended for the imparting of technical knowledge. Of less importance to the Company, perhaps, though of equal importance to the individual, is his general education. Finally, and most important of all, is the very generally ignored item of personality. The reputation of the Company largely depends on the conduct of the local staffs, and in dealing with the public as much importance should be attached to courtesy as to any other points enumerated later. And by courtesy I do not mean mere civility. Take your hat off in a private office even if the boss is not in. Show a personal interest in the subscriber's trouble, whatever it may be, and if you must refer it to another department let the subscriber know the facts of the case. Though a man's personality is not altogether a product of education, there is no doubt that a man's character will be influenced by his education no less than his work is influenced by his character, and so in considering education I shall keep in view the fact that the student has a character to be trained.

In recommending any studies to junior members of the staff I should point out that something more than the mere addition to their general knowledge is to be considered. I am sure that many students have a wrong conception of the use of study. It is not so much the total amount of knowledge at any moment available that is the chief asset of a student; rather is it the fact that he has a mind trained to make use of new information—a tool in the hand of a workman who knows how to use it. Whatever subject is taken—mathematics or lathe work, chemistry or engineering, the student must learn the necessity for thoroughness in all things—in making a galvanometer needle, or in verifying the facts upon which he will base a proposition. Thus will he acquire a self-confidence not otherwise obtainable. He will be accustomed to success in his work, whether in regulating a call-office buzzer or dealing with a subscriber, and *in so far as he has learnt to be thorough in his work so will his whole habit of mind reflect that education.* On the other hand, slovenly work creates as well as indicates a slovenly mind. By his colleagues and seniors such a man is soon valued at his true worth, and is briefly characterised as unreliable. Studies, and more particularly practical work in the engineering laboratory, teach a man to be methodical and cautious, teach him the necessity for patience and perseverance. He is also given an opportunity for exercising any ingenuity he may possess, and proving the truth of the much-quoted definition of an engineer—"a man who can do well for a dollar what any man can do somehow for ten." Some such indirect benefits may be hoped for from a study of any of the sciences, and though only a by-product, are of the utmost importance.

I remember well an article that appeared in one of the American magazines some years ago, in which I noted the following passage:—

> It is my constant observation of four engineering works employing about 20,000 men that engineers reach the limit of their usefulness from defects of character rather than from want of technical attainments.

This, I think, will be borne out by anyone in a position to judge, and convinces one that too much emphasis cannot be laid on the training of character.

The next consideration is technical knowledge. This chiefly concerns the staffs of the Engineering and Electrical Department, and to a lesser degree the contract and stores. As previously mentioned, classes are useful aids to those anxious to master the theory underlying their daily work, but a little discretion is advisable in the choice of the subject taken. It is wasted time to take on more classes than can be kept pace with throughout the session, and worse than waste of time to undertake a subject in which the preliminaries have not been mastered.

In last year's report by the City and Guilds of London Institute the pessimistic tone of the examiners in electrical subjects is most noticeable. In telephony they say:

> Arithmetic is a stumbling block, and there is general evidence of undigested knowledge. The drawing was, with few exceptions, indescribably bad.

The lack of preliminary training in physics, mechanics and drawing was also commented upon. On the practical side, although "electrical testing" classes are largely taken by the staff, workshop practice is nearly unknown. In the Metropolitan area the staff is allowed some latitude in the choice of classes, and any man can take up a course of electrical instrument making if he wish, but he generally does not wish. Such a course, to my mind, is of the greatest benefit to inspectors or fitters, and to have had some workshop experience of lathe work and the use of tools is of the utmost value. In the Post Office, I am informed, the inspecting staff is largely made up of men who have served in the instrument workshops of Mount Pleasant and Holloway.

The marked difference between the quality of the work turned out by the average mechanic or carpenter and many telephone inspectors shows how few members of the staff have profited by their opportunities. The latter lacks the training that the former has had to undergo before he became a qualified workman, and the Company suffers in consequence. The operating school has already been dealt with in the pages of this JOURNAL, and it is something on those lines that is needed for the electrical staff. In the short remaining period of the Company's license such a procedure is probably out of the question.

A short time ago one of the chiefs engaged on special work with a staff of some 90 men suggested a series of lectures on the work then being put in hand. He further, and in my opinion, very reasonably, intended to close the series with an examination that should give him an insight into the progress made, and an idea of the capabilities of the attending staff. Incidentally the examination would point out the students' weak spots and give the teacher a chance of rectifying the errors. At the suggestion, however, of any examination being held there was a considerable fuss, chiefly, I

suppose, from men who feared to lose their jobs on failure to pass the examination. This was not held, but the question remains: Were the men right in their objection? Examinations are held, I understand, by the Post Office in order to prove an engineer's fitness to rise to a senior rank, and the objection is made that such a test gives an unfair advantage to the young student with plenty of book knowledge and no practical experience, but the point is overlooked that periodical tests alone can show that he is able to acquire and hold new information.

A word in conclusion about the instrument inspector and his work. "Times change, and we with time" is unfortunately not true of many old stagers that learnt their work ten years ago, and have since learnt nothing more. With the coming of the central battery system more complex circuits are introduced, and it becomes necessary for the men to educate themselves to these new conditions. The opportunity is now.

REMARKS ON CANVASSERS, CALL OFFICES, DIRECTORIES AND OTHER TELEPHONE MATTERS.*

BY A. D. PIKE, *Local Manager, Cheltenham.*

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I AM firmly convinced that canvassers are "born, not made." Some canvassers are altogether too elaborate; others have not enough "side." Two things the canvasser cannot have too much of are energy and patience. He must be prepared to answer all questions which a prospective subscriber may bombard him with. In fact he must be a walking telephone encyclopedia.

Only those who are in direct touch with the canvasser know how difficult it is to obtain orders. Day after day he will be slogging away with apparently no results. It's quite possible he may have been working on a case for weeks. Suddenly the doubting Thomas makes up his mind, walks into the office and signs a contract. This order is undoubtedly due to the canvasser's energy; but, unfortunately, he does not always get the credit for it. He may leave his card or an agreement form, but all to no purpose. There is a certain class of the British public who always want to see the manager. They would see the General Superintendent if they could only get at him, and it is just this particular class which tries the patience of the canvassers so much.

Energy, tact, patience and good temper are a canvasser's assets, and without these he will soon be bankrupt. Of course it goes without saying that he must be an enthusiast in the Company's business. Technical knowledge is not absolutely necessary; but the canvasser who *does* possess any is in a much stronger position than his fellow canvasser who does not.

I have been told many times that canvassers are quite an unnecessary luxury. When a man wants a telephone he will quickly apply for it; why, therefore, employ these special men? I'm like the Scotsman, "I ha'e ma doots." It's no easy task to persuade a man to part with £5 or £6 for something he has done without all his life, and his father before him. Hundreds of our subscribers have only been obtained by the sweat of the canvasser's brow. Besides, there are the private lines, metaphones, electric bells, etc., in which the Company trade. The Contract Department must never be still. It sometimes occurs that an outside firm beats us in price; but I have yet to find the firm who can beat us in material and workmanship. I have obtained many an order (in open competition), although the Company's price has been higher than the local firm's, purely owing to the high reputation of the Company's material and workmanship. A short time ago I tried very hard to obtain an order from a firm in this town for a small private line installation. The Company's price was 12*s.* 6*d.* higher than another firm's. I could have easily got the job, even allowing for the difference in price; but the local firm promised a three years' guarantee. The line was duly installed. The enterprising firm has left the town for fresh worlds to conquer; and I often wonder how the owner will be able to enforce his guarantee. Only last month I obtained an order for an extension of this particular installation, and was very pleased to learn that the owner did not trouble about getting a competitive price. Apparently he had had enough of local telephone work. I think we can in this case say that "it's an ill wind which blows nobody any good."

WAYLEAVING.

If tact and patience are required on the part of a canvasser, what must be required to make a good wayleave officer? The wayleave officer has, I verily believe, the most unwelcome and difficult task in the whole of the company's service. Everyone looks on him with suspicion. The rate collector is more welcome than he. There are people alive who recognise that the granting of a pole permit in their backyard will do no harm; but, unfortunately, these telephone samaritans are few and far between. The value of the two feet of ground required for the pole has a sudden and most remarkable rise in the market. It's absolutely phenomenal. I'm sure Mr. Lloyd George would pick up a few wrinkles if he went out with a wayleave officer for a week or two. He must have a fair knowledge of wayleaving.

Wayleave officers, like canvassers, could tell many a good story. The peculiar fads and fancies of some of our wayleave grantors would, I have no doubt, make interesting "matter" for the humorous side of the JOURNAL. I remember once obtaining a wayleave in the north-west province by promising to have the pole painted red, white and blue. The grantor wanted to have a flag fixed on the top as well; but here I struck. We finally came to terms by the promise of a weather vane. The erection of this pole caused quite a sensation; and looked for all the world like a glorified barber's pole. I believe that if we had wanted to move it the landlord would have bought the pole outright sooner than be without it. Another case which occurred in the same town is perhaps worth relating.

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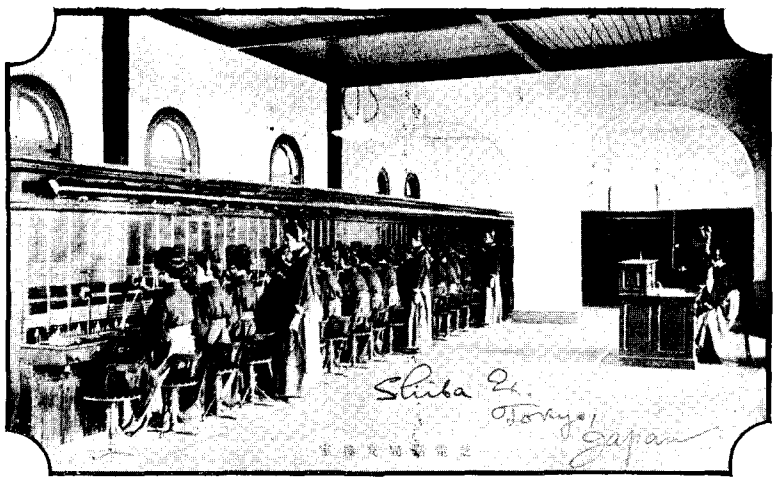
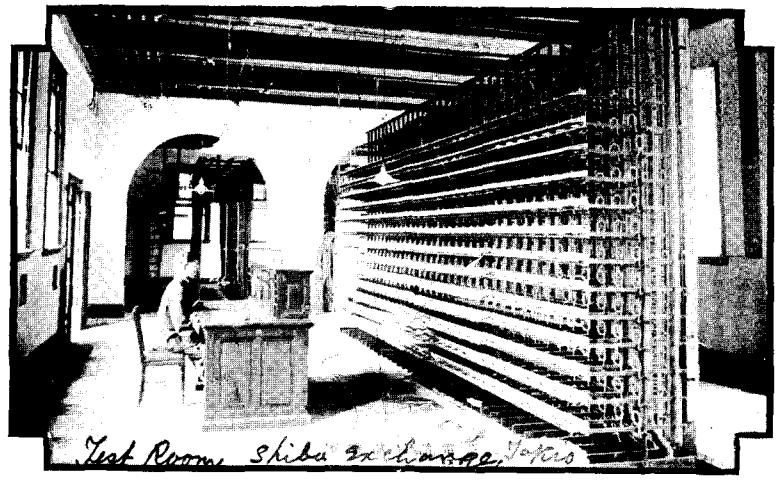
NEW SHIBA EXCHANGE, TOKIO, JAPAN.





[We are indebted for the above interesting photographs to Mr. RIVJI NAKAYAMA and other Japanese telephone engineers.]

as a profitable undertaking. Personally, I am not in favour of them. I really think it is a case of "heads I win, tails you lose," from the shopkeeper's side. Nine times out of ten he stands to gain custom by its presence. People who, perhaps, would never dream of entering his shop but for the telephone feel morally (although quite unnecessarily) bound to purchase something at one time or the other. The shopkeeper has, generally speaking, a most effective way with the habitual user of his call office. "Mutual reciprocation will be esteemed," was a sign I once saw pasted to the window of a call box. The telephone user is not always desirous of patronising the shopkeeper, and does not care to be pestered into making superfluous purchases; and in consequence ceases using the call office. Directly the call office begins to pay its way, the shopkeeper invariably demands a share of the profits. The fact that it may have been a losing concern to the Company for some time past does not trouble him. His demands must be met, or else notice will be given to terminate. Coming to the outside call office, quite a different aspect is shown. All the inside annoyances (or nearly all) are eliminated. Once your site is settled, you have only to erect your kiosk, and, with the exception of a nominal peppercorn rent and the lighting bill, you have no more expense. If there is a profit, it goes into the pockets of the Company, who first ventured there. An outside telephone is open to everyone. No moral obligations exist here. From the King to the crossing-sweeper one penny connects all comers to any person connected to the exchange. The importance of the street call office cannot be over-estimated, and I am one who takes a very optimistic view of the future of the kiosk type of call office. We have just fitted a kiosk call office, and the receipts so far have been most satisfactory. Before fixing it was necessary to obtain the consent of all the tenants and owners in this street; and it is interesting to know that not one dissentient voice was raised. I wonder if we should have been so fortunate if it had been a pole?

CALL OFFICES.

I would like to make a suggestion in connection with the Notts Factory pattern kiosk. Instead of plain glass windows, I would suggest "frosted" ones. Few people pass a kiosk without having a good look at the person who is using the telephone, and the street boy is not yet born who does not stop and glue his nose to the window pane, apparently with the fixed determination of not only hearing what the call office user is talking about, but also to hear what the distant user is saying as well. Frosted glass would, I think, do away with these annoyances.

OPERATING.

The operating figures for this district shown are most encouraging, and reflect great credit upon the clerk in charge and her operators. The great "stock-in-trade" of an operator is her ability to be always cheerful and good tempered. Let her cheerfulness be that of a smiling philosophy which nothing can quench. When saying "Number, please," let it be said in such a manner as gives the subscriber the impression that he is conferring a favour by giving you the desired number. Its good for you and good for the Company (especially if the subscriber is on the measured rate). He will feel anxious to make another call, if only to hear such an accommodating voice.

LONDON NOTES.

A LARGE audience assembled to hear Mr. Nicholls read his paper on "Office" at the telephone society on Nov. 3. We congratulate Mr. Nicholls on having been selected by the papers committee as the representative of London in the contest for the Head Office premium.

ONE of the officers in the Electrical Department has introduced a happy method of helping the inspectors on his staff to state and overcome their difficulties. When the men are being supervised at their work, a note is made by the supervising officer of any little troubles observed, such as inefficient or inadequate tools. The men are then invited once a fortnight or so to have an informal talk about such points, and are encouraged to a free expression of views as to methods of working and possible improvements. Attendance at these unofficial gatherings is optional, but I believe that their originator is quite satisfied with the result. They certainly seem to be on right lines, and if conducted with care and discretion should be of value to all concerned.

THE first "Bank" whist drive of the season, on Nov. 10, yielded not only a pleasant evening to the 280 people present, but a welcome sum of £5 5s. to the Hospital Saturday Fund. This result was due to much hard work on the part of the committee, and Miss Reekie. Mr. Clay, Miss Minter, and Miss Ralph were donors of prizes, and Mr. Edmonds distributed the rewards of their skill to the visitors.

THE second of the telephone society's elementary lectures was very well attended. Mr. Bryson illustrated his description of the Company's bookkeeping methods by a number of slides showing the various books and returns. These slides, I understand, were prepared by Mr. P. V. Dowson, the London Head Office auditor, and certainly did him great credit. One disappointing feature of the meeting was the paucity of questions. It is to be hoped that at the next lecture, on Dec. 1, Mr. Bryson will be met with a few more "posers."

HIS many friends will join in congratulating Mr. W. B. Benham, Exchange Manager, London Wall, on his promotion to be one of the Traffic Manager's Assistants. Consequent on Mr. Benham's transfer there have been numerous other changes amongst the exchange managers.

IN the first round for the Clay Challenge Football Cup, Salisbury House (holders) are drawn against the Workshop. The match is fixed for Nov. 20, and unfortunately these notes must go to press before then.

THE telephone society's traffic branch meeting on Nov. 16 passed off well. The two openers—Miss Etheredge, of the Traffic Managers' Office, and Miss Flinn, Exchange Clerk, Avenue, earned a well-deserved encomium from the Engineer-in-Chief. The former had as her subject "The Human Element in Traffic Matters"; the latter "The Value of Local Knowledge." There was some difficulty in getting members to take part in the discussion; it is to be

hoped that this diffidence may be overcome, as a full and free interchange of views will be the most helpful feature of the meetings. The attendance of 268 was distinctly encouraging.

NEW CROSS following what may now be regarded as an established precedent, held an "at home" in the new exchange premises on Nov. 13. The relatives and friends of the operating staff, to the number of 70, were shown all the features of interest by various traffic and maintenance officers, who unselfishly gave up their half-holiday. Keen appreciation was shown by the guests, and at the close, the traffic staff maintained their hospitable traditions.

To those who know Mr. E. A. C. Sandy, it will probably come as a surprise that he has just completed 30 years' service. Mr. Sandy has found the secret of perennial youth, and those who have known him longest say that he does not look a day older than when they first knew him. He entered the service as an operator in 1879, there being three operators and a clerk-in-charge to attend to four subscribers. Since then Mr. Sandy has filled many posts. At present he is in charge of the Correspondence Department, and is well-known throughout London as having a pronounced destructive tendency for papers only. In the country he has become almost famous—certainly his name has—as the principal secretary of the Staff Transfer Association.

THE chess club have played three league matches up to date, but the results have been rather disappointing, largely owing to the fact that the strongest players have not been available. The next match is *versus* General Post Office, Central Telegraph Office, on Dec. 14, and it is to be hoped, for the credit of the players amongst the staff, that a better team will then be available.

Mr. R. P. Lowe would gladly welcome new members at "Ye Mecca," 140, Cheapside, on any Thursday evening after 6 p.m. J. S.

GLASGOW NOTES.

AN interesting variation was adopted in connection with the November meeting of the telephone society, a prize night being announced. Papers were asked from the minor members of the staff only; seventeen were submitted, and four of these secured prizes. Those successful were: Mr. R. P. Buckeridge, "How to Spend Money"; Mr. James Donaldson, "Hillhead Central Battery Exchange"; Mr. J. W. M. Kennedy, "Ideas Suggested from Disputes with Subscribers"; and Mr. Alexander Roseboom, "Jointing Dry-Core Cables." A high degree of excellence was shown, which is all the more satisfactory seeing two of the papers were first attempts.

THE meeting-place of the telephone society is the magnificently equipped New Technical College. A large lecture room, with lantern and other appliances, is provided free of cost by the Technical College authorities. A further innovation has been agreed to this season by the governors: at the close of the meeting members of the society adjourn to the refectory for tea and coffee, smoking also being allowed. The college authorities have shown exemplary broadmindedness in thus assisting our own and similar technical societies.

THE first meeting of the current session of the National Telephone Operators' Society and Club was held in the Masonic Halls, 100, West Regent Street, Glasgow, on the evening of Oct. 25, 1909, Mr. T. Rodger being in the chair, when Mr. W. Allan, electrician, read a paper on "The History of the Telephone."

THE committee of the telephone society and club have arranged for the provision of tea at the club rooms prior to the meetings. This has proved a boon to many of the members who find it difficult to get home and be back in time, and it has also been found of great service from a social point of view.

THE following members of the staff have obtained certificates a result of the City and Guilds examination. In ordinary grade telegraphy, R. P. Crum first class; in ordinary grade telephony, Alex. Maclean secured a first-class certificate and Thos. McIndoe, Alex. Reid, Jas. Brown, R. P. Crum, Chas. S. Gibson, and T. M. Carter second-class certificates.

IT is gratifying to note that a large number of the staff are again studying telephone and kindred subjects during the present session, 131 having enrolled for the Correspondence Classes and 170 for the Technical College classes. The Company's interests in the education of the staff is thus fully taken advantage of.

A DINING club has been started for the convenience of the clerical staff who "dine out."

A GOLF club has been formed in connection with the Glasgow staff. An attractive programme has been drawn up, and a start was made in the monthly medal competition on Oct. 16 over Blackhill course, when Mr. W. Patterson was declared the winner, with the nett score of 96. The captain of the club is Mr. R. F. Kirkwood and the secretary Mr. D. B. Hebenton.

ARRANGEMENTS are now in hand for the staff's annual dinner, and the date has been fixed for Friday, March 4 next.

THE many friends of Mr. J. H. H. Boyd, Stores Clerk, will be pleased to hear of his success in the elocutionary world. At the annual competition of the Scottish National Song Society held in Edinburgh recently he was awarded the Scottish amateur championship gold medal for elocution. Mr. Boyd has at various times given the staff the benefit of his talent at its social gatherings.

As the result of the appointment of Miss Margaret Fyfe (operating staff) and Mr. J. W. M. Kennedy (clerical staff) as special agents in Glasgow, 130 new subscribers for the JOURNAL have been obtained. The personal touch has once more scored. X. Y.

CORRESPONDENCE.

TRAFFIC.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

REGARDING Mr. Bell's letter upon "The Education of the Public," I should like to point out that in hundreds of cases instruments are fitted where the subscriber is *not new to the service* or its system, but where they are a little friendly tuition is sometimes desirable. A connection to a clerk-in-charge in the former case would obviously be superfluous, but information could be readily ascertained from a subscriber *as to his knowledge* of the service by the inspector fitting the instrument.

Where the public are totally ignorant of using a telephone, I still adhere that the first connection should be to a responsible official of the Company, for reasons I have already stated.

Impressions are all too quickly formed, particularly indifferent ones, creating influences *for or against*; if prejudicial, they are not easily effaced. Our editor ably points out my meaning in this direction. Mr. Bell's suggestion of a small booklet for the use of subscribers should prove helpful; but the public, unlike operators, are not interested in literature pertaining to instruction, as witness the disregard of automatic box and other forms of printed matter. A preference is in most things given to oral explanation and information, and it is in the interest of all concerned that the new subscriber begins well.

Whatever advancement is made towards the educating of the public, may it commence by subscribers learning to announce themselves or the firm they represent immediately upon receiving their ring in place of the unavailing "Are you there?" or the exasperating and meaningless "Hulloa!"

Scarborough, Nov. 10. F. MAUDE DISTIN, Clerk-in-Charge.

THE MONITORS' TABLE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL

THE disadvantages of operators giving to the monitors details of a complaint before connecting the subscriber are more fancied than real, and a re-perusal of the particular sentence concerned will, I think, and hope, induce Miss Marshall to modify her written opinion on the points involved

(1) An operator is usually able to say a great deal in a very short space time, and a brief, concise statement can be made in three seconds. To fit the case cited by Miss Marshall no mental effort is required to condense the fact that "the subscriber is impatient, and gives the clear before the person he requires can be brought to the telephone" into fewer words, and the result will, in the hands of the monitor, justify the slight delay; (2) no hindrance will occur where team work is being properly carried out, and a state of "breathless flurry" betokens an unfinished operating school training and a lack of proper supervision; (3) if the operator gives valueless information at the time of the complaint I am afraid that her training has been entirely neglected, and it is not much use prosecuting enquiries at a later period. The subscriber should not be in a position to make any accusation unless this poor, very poor, operator has allowed him to be in circuit whilst telling her tale of woe. The monitor should, of course, listen to both sides of the question (if it has two sides).

(4) It is not my experience that a subscriber prefers to be called later; the business man is usually willing to accept any reasonable explanation if it is given "instanter."

(5) The remarks of the divisional supervisor and the ground covered by them would be *nil*. Her time would be more profitably spent in preserving a calm frame of mind in the operators under her control.

I agree that the operator is not condemned (unless by the unfortunate subscriber) unheard, but the facts of the case determine the decision, not the question of who had the first innings.

It is hoped that Miss Marshall has not known many cases like that cited at the end of her letter, otherwise I am afraid that a certain proverb anent "guilty consciences" must be particularly applicable to the staff with whom she has come into contact.

Liverpool, Nov. 12. H. A. HINCKS.

AUTOMATIC TELEPHONY.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I HAVE been very interested in reading the various comments in the JOURNAL on automatic telephony, and thought that my experience when visiting the United States a couple of years ago would not be amiss. I then had the opportunity of conversing with several subscribers to automatic exchanges, notably those at Los Angeles, Cal., with 30,000 to 35,000 working stations; Chicago, Ill., with 10,000 stations, and other smaller systems, and what impressed me most was that they looked upon the automatic as an accomplished fact, and could scarcely believe that folks our side of the pond were at all sceptical as to its possibility. I also gathered that in offices where both the automatic and manual were installed the former was preferred, as a quicker and cleaner connection was obtained, contrary to what we have been led to believe. The subscribers found a certain amount of satisfaction in doing something whilst they were obtaining the connection, in a similar manner to the subscribers who objected to central battery instruments because there was no handle to turn.

Although it seemed scarcely credible that operators could ever be entirely replaced in a city like London, yet the invention of the line switch—the simplification of the selecting device whereby the earth on the subscriber's instrument is dispensed with—and the introduction of automatic ringing all seem to be steps in this direction. At any rate, it appears probable that at no very distant date small suburbs outside our cities will be equipped with semi-automatic switches built in concrete chambers, either on inexpensive plots of land or under the pavements. This scheme has been adopted at Richmond, Va., Columbus, O., and other cities in America, and enables a subscriber with an ordinary central battery instrument to trunk in direct to a local answering jack at the main exchange by simply lifting his receiver in the ordinary way. He would also be able to flash the supervisory lamp and clear the connection in the orthodox manual fashion, and, in fact, need not know that he had no through line to the main exchange.

In conclusion, I would mention that although I believe the foregoing to be quite possible, yet I think the operators may comfort themselves with the consolation that the conservatism which is inherent in Government departments may postpone such a radical change for another generation or so.

F. MORLEY WARD, Exchange Electrician, Dalston.

[We adhere to our remarks on page 144. As regards the subscriber's amusing himself by doing the operating in preference to waiting, with a prompt service his entertainment is somewhat of a superfluity. Before the automatic subscriber has completed his exhilarating pastime the manual subscriber should be talking to his correspondent.—ED., "N. T. J."]

FUSES.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

IN answer to "Short Circuits" enquiry perhaps the following remarks may be of interest to him:—

Copper has a high melting point and therefore does not fuse easily. It will work in a heated state and becomes oxidised and then may fuse with much less current then a new one. When a copper fuse does "blow" it is apt to discolour the china or slate base, and may break it owing to its high temperature. It is also expensive as compared with lead. For ordinary circuits and low pressures lead forms a satisfactory fuse, because it has a comparatively low melting point and in consequence it is frequently recommended by engineers for branch circuits, since it is advisable in case of a "branch" short circuit for that particular fuse to "blow" first, and not the main fuse, as this latter may affect the whole of the circuit. J. H. TAYLOR (Inspector, Burnley).

REPEATING COILS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

IN the second paragraph of Mr. G. H. Bryant's paper on the above in the November issue of the JOURNAL, he makes what I consider to be a misleading statement, viz.: ". . . and as the repeater will give out an alternating current in the listening side no matter . . ." Now, so far as I can see, reasoning the matter out, neither the receiving side of the repeater nor the transmitting side ever under speaking conditions has alternating current passing. If we consider a simple case I think I can prove this point.

Assume the resistance of two lines connected by a common battery cord circuit to be such that when the receivers are off the rests and the transmitter diaphragms are absolutely still the current flowing in each line is 60 milliamperes. Whenever the transmitter diaphragm moves the current alters; let us suppose that in the sending side it increases to 61 milliamperes. The increase by 1 milliampere in one side of the repeater will induce in the other side an electro-motive force tending to send a current of 1 milliampere round the receiving line. If this induced electro-motive power assists the 24-volt battery then the result will be to increase the current already flowing to 61 milliamperes. On the other hand, should the induced electro-motive force be in opposition to the 24-volt battery then the result would be to reduce the current already flowing to 59 milliamperes.

I think from the foregoing it will be seen that even if we considered extreme cases, where one line had a very low resistance and the other a very high resistance, or where each line had a very low resistance, the electro-motive forces induced by the comparatively small variations in transmitter resistance can never possibly be greater than the electro-motive force of the battery, *i.e.*, 24 volts; therefore we cannot have an alternating current in the receiving line circuit.

Another reason why the line current cannot be an alternating one can be seen if we consider the working of the supervisory relay.

If the current in this relay were alternating with a low frequency the relay would "chatter"; but if of a high frequency the time allowed for the core to go thr ugh a complete cycle of magnetisation would be so short that the working of the relay would be the reverse of reliable.

I may here say that I agree with Mr. Bryant when he says that it is alternating current which actuates the receiver, but this is because the current passes through another transformation in the induction coil.

Before closing I should like to say that, speaking personally, a few practical articles like Mr. Bryant's would do much to make the JOURNAL more interesting. I do not think that members of the electrical staff are the only ones who would like to read articles dealing with the actual manufacture of the different pieces of apparatus in daily use.

I recommend this last paragraph to the consideration of the "Editing Committee."

Glasgow, Nov. 15. A. S. DUNCAN.

[Whenever members of the staff submit interesting articles such as Mr. Duncan suggests, the Editing Committee will always give them the readiest consideration.—ED., "N. T. J."]

THE INSTITUTION OF ELECTRICAL ENGINEERS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

THE discussion on Mr. L. E. Wilson's paper on "Telephones," read before the local section of the Institution of Electrical Engineers, at Manchester, leads me to write on a subject regarding which I have felt strongly for a long time.

From the reports in the technical press I gather that at the meeting only one member of the National Telephone staff took part in the discussion. I understand, further, that no members, or at any rate well-known members, of the Manchester staff were present, and it is a fact that throughout the country many qualified members of the Company's staff are not members of the institution.

The keynote of the improvement in telephone work in recent years has been education, and the meetings of the institution afford a very valuable means of education in matters which are not immediately telephonic in character, but without which narrow and limited views are likely to grow up. There is the further argument that each person calling himself a qualified technical man has a duty to his profession (which is of course, from a broad point of view, only his duty to himself), and one of the accepted ways of helping to discharge that duty is to belong to whatever institution is recognised as that which promotes the progress of the particular profession.

If everyone followed the selfish idea of trying to obtain the benefits of the labour of others without contributing to the cost, the progress of industry would be effectively prevented, and, from the individual point of view, such a course would be not only selfish but futile as well; viewed from the standpoint of cost to the individual, the real question is not "Can I afford it?" but rather, "If I am qualified to be a member of such an institution, can I afford to remain outside?" F. GILL.

NEWS OF THE STAFF.

Mr. E. L. PRESTON has been appointed Engineer at Bristol. He was apprenticed to the Western Counties and South Wales Telephone Company in 1891 at Bristol. In 1893 he was transferred to Gloucester as Chief Inspector. In 1899 he was appointed Local Manager at Weston-super-Mare centre, and in 1905 Local Manager at Bristol.

Mr. S. C. COWARD has been transferred from the contract office in Liverpool to be Contract Agent for Birkenhead centre. Mr. Coward was transferred to Liverpool three years ago, having previously held the position of Contract Agent in Leicester.

Miss SARAH PENNEY, Operator, Glasgow, who left for Canada on Nov. 3, was presented by the staff of the Royal Exchange with a dressing case and a writing case.

Miss ISABELLA B. HAMILTON, Operator, Glasgow, who left the service on Oct. 14, was presented by the staff of the Tron Exchange with a gold brooch.

Mr. A. MASON, Engineer's Clerk, Leeds, was the recipient, on leaving the Company's service, of a travelling bag and fountain pen, in addition to several other articles for personal use. He had been in the Company's service about six and half years, and had carried out his duties in a particularly able and conscientious manner. He left the service to go to college, and is ultimately intended for the Church of England South Sea Missionary service.

Line Foreman JAMES KELLY, London, retired on pension on Oct. 17, after over 25 years' service with the Company, having entered it in February, 1884.

Miss M. SPIERS, Operator, Central Exchange, Birmingham, has been promoted to be Supervisor.

Mr. ALBERT POPE, of the Printers' Office, Head Office Stores, has received the Royal Humane Society's testimonial on parchment for gallantly saving the life of Charles Poncia, who was in imminent danger of drowning in the Grand Junction Canal, Greenford.

Miss ELTA MAUDE FLUX, who has occupied the position of Clerk-in-Charge at Newport, (Mon) Exchange during the last seven years, resigned her position on Oct. 28 to take up other duties outside the Company's business. She was presented with a silver-backed hair brush and comb, silver button hook, etc., enclosed in a suitable case; Mr. R. Williams, the Local Manager, making the presentation. The whole of the staff (including Office and Instrument Department) expressed regret at losing Miss Flux, and wished her every happiness in her new work.

Mr. J. G. HONOR, Inspector, Hull, has been transferred to Grimsby as Chief Inspector.

Miss E. C. PARKER, Clerk-in-Charge, Maidstone, having left the Company after ten years' service owing to family bereavement, was presented by the staff with a silver manicure set as a token of esteem.

Mr. M. HESSEY, Sheffield, has passed the second-class mathematics (stage 1), Sheffield University.

Mr. J. D. MACLEOD, Mid-Lanark district, has been appointed Electrician vice superseded title of Chief Inspector.

Miss EDITH VAN RIEL, Senior Supervisor, Cardiff Exchange, has been promoted to the position of Clerk-in-Charge of the Newport Exchange in the Cardiff district. Miss Van Riel joined the Company's service on Nov. 2, 1898, and has successfully filled the position of both Operator and Supervisor. On the occasion of her transfer Mr. Marsh, on behalf of the traffic and operating staff, presented her with a marble clock as a mark of respect, and with best wishes for success in her new position.

Mr. J. EMLYN JONES has been appointed Electrician, Bristol.

Mr. A. E. COOMBS, Exchange Manager, Bristol (formerly Exchange Manager, Swansea), has been appointed Traffic Manager, Bristol district.

Mr. HARRY ALBERT HINCKS has been promoted from Assistant Exchange Manager, Central Exchange, Liverpool, to be Exchange Manager of the new Liverpool Bank Exchange. Mr. Hincks entered the service in 1901, and has been successively Instrument Inspector, Exchange Inspector, Test Clerk and Assistant Exchange Manager.

Mr. WILLIAM HERBERT KYNASTON, Exchange Inspector, Liverpool, has been appointed Night Exchange Manager for the Liverpool district.

Mr. T. J. CLARK, Chief Clerk, Norwich, will, on Dec. 3, complete 30 years' continuous service with the amalgamated telephone companies.

Miss LILIAN DAKERS, Superintendent of the Alexandria Exchange, Egypt, who was formerly on the Manchester staff, and for some time Clerk-in-Charge at Bolton, has been during the past three and a half months incapacitated by typhoid fever. Miss Dakers' many friends will be pleased to hear that she is now recovering and hopes shortly to resume her duties at Alexandria.

London Traffic Department.—*Promotions and Transfers:*

Mr. E. STANLEY BYNG, A.M.I.E.E., Assistant Engineer, Brixton, has been transferred to the Study Department of the Metropolitan Engineer's office.

Mr. G. F. TERRY, Wayleave Officer, Dalston, has been promoted to be Assistant Engineer, Battersea.

Mr. J. G. PHILLIPS, Assistant Engineer, Gerrard, has been transferred in the same capacity to Brixton.

Mr. R. W. WOOLLARD, Apprentice, has been appointed Assistant Engineer, Sydenham.

Mr. G. C. GEISLER, Draughtsman, Salisbury House, has been appointed Assistant Engineer, Dalston.

Mr. J. H. PATTMAN, Clerk, Electrophone Department, has been appointed Inspector-in-Charge of Electrophone Department.

Mr. W. R. CROWE, Inspector, Gerrard, has been appointed Clerk, Electrophone Department.

Mr. D. HUTCHISON, London Study Department, Metropolitan Engineer's office, has been transferred to Gerrard as Assistant Engineer.

Mr. C. H. PHILLIPS, Assistant Engineer, Sydenham, has been transferred to Study Department, Metropolitan Engineer's office.

Mr. V. JONES, Inspector, Gerrard, has been appointed Fault Clerk, Gerrard.

Mr. J. JOSEPHS, Engineer's Clerk, Gerrard, has been promoted to be Chief Clerk, Divisional Engineer's office, Dalston.

Mr. WILLIAM B. BENHAM, Exchange Manager, London Wall, who has been promoted to be Assistant Traffic Manager, was on Nov. 16 presented by the staff at London Wall with a hand-coloured photogravure suitably framed and a pair of gold sleeve links. While expressing their keen regret at his departure they wished him every success in his new position.

Mr. GEORGE H. WILKINSON, Exchange Manager, Bank, has been transferred to a similar position at Hop On Nov. 17 he was entertained to tea by the Bank staff, who also made it an occasion for welcoming Mr. JAMES JENKINS, who has been transferred there as Exchange Manager from a similar position at Dalston. Mr. Wilkinson was presented by the Bank traffic and maintenance staff with a very handsome diamond scarf pin, accompanied by their best wishes and expressions of regret at losing him.

Mr. PAUL J. MANTLE, Exchange Manager, Avenue, has been transferred as Exchange Manager to London Wall.

Mr. FRANK H. GROVE, Exchange Manager, Hop, has been made Exchange Manager, Avenue.

Mr. HAROLD C. TOWNSEND, Assistant Exchange Manager, London Wall, has been promoted to be Exchange Manager, Dalston.

Mr. SIDNEY W. HARVEY, Assistant Exchange Manager, Hop, has been transferred to the Maintenance Department, Gerrard.

Mr. GEORGE H. WELDON, Assistant Exchange Manager, Avenue, has been transferred to a similar position at Hop.

Mr. FRANK R. HOOPER has been transferred from the Maintenance Department to be Assistant Exchange Manager, Avenue.

On the occasion of the transfer of Miss ALICE BELL'S promotion from the Hop Exchange to be Supervisor, Bank, she was presented by her colleagues with a gold-mounted umbrella.

MARRIAGES.

Mr. T. CORNFOOT, Chief Electrician, Birmingham, was presented by his staff, on the occasion of his marriage, which took place during September, with a barometer and silver cigarette case.

Miss NORAH WOOD, Senior Operator, Rusholme, resigned Oct. 21 owing to her approaching marriage. Her popularity was shown by the numerous handsome presents given her by the members of the staff, including a rose bowl, bronze ornaments, a tea service, and many trinkets which she received from individual operators, together with the hearty good wishes of the whole of the staff.

Miss ANNIE WOOD, Operator, Central Exchange, Manchester, who has resigned to be married, was presented by the operating staff with a handsome set of carvers and a case of cutlery. Miss Wood leaves England for Bombay on Nov. 19 to meet her future husband, Mr. Hollinghurst, of Bombay Telephone Company (late Inspector at Central, Manchester).

Miss MINNIE WALLACE, Senior Operator, was, on the occasion of her marriage, presented by the staff of Douglas Exchange, Glasgow, with a handsome case of teaspoons, sugar tongs, butter knife and preserve spoon, and also a pretty purse.

Miss ANNIE BRUNTON, on leaving to be married, was presented by the staff of the Argyle Exchange, Glasgow, with a silver cake basket.

Miss SARAH JONES, Operator, Argyle Exchange, Glasgow, who has left to be married, was presented by the staff of that exchange with a dressing case.

Miss D. MCBETH, of the electrician's office, Glasgow, was married on Oct. 14, and, prior to leaving the service, was presented with a case of cutlery.

On Nov. 5, Contract Officer WILSON, Sheffield, was, on the occasion of his marriage, presented by the Contract Manager, on behalf of the staff, with a dinner service.

Mr. D. J. W. CLIFFORD, Local Manager, Limerick, who was married recently, has been presented with a breakfast service by the local staff, while the Cork staff presented him with a case of cutlery and dinner cruet. Mr. Clifford, who was transferred from Cork centre in 1899, is a very popular officer, and has the hearty good wishes of the South of Ireland staff for his future welfare.

Mr. H. KNOTT, Chief Inspector, Colchester, was on the occasion of his marriage, which took place on Oct. 18, presented with a pair of silver-plated flower vases. The presentation was made by the Local Manager, Mr. D. R. J. Downing, who conveyed the sincerest good wishes of the Colchester staff for Mr. Knott's future happiness.

Mr. E. RHODES, Exchange Inspector, Redhill, was presented by the staff with a dinner service and fruit dish on the occasion of his marriage.

Mr. E. PAXTON, Instrument Inspector, West Hartlepool centre, who was married recently, was presented with a dining table, timepiece and silver salts.

Miss ANNIE GREENFIELD, Operator, Hartlepool Exchange, on resigning to be married, was presented with a coal box and fancy plant pot. The presentations in each case were made on behalf of the staff by the Local Manager, Mr. A. T. Mushens.

Mr. A. H. WARD, Instrument Fitter, Table Set Department, Nottingham Factory, was presented with a handsome oak timepiece by his fellow-workers on the occasion of his marriage on Oct. 16.

London Traffic Department.—Presentations were made by the East Traffic staff to the following colleagues who have left to be married:—

Miss ELIZABETH BRYDEN, Supervisor, a dinner service.
Miss GERTRUDE ELVERSTONE, Operator, a tea service.
Miss FRANCES WILSON, Operator, a fire screen.
Miss MABEL CHAPMAN, Operator, two oak trays and specimen glass.

OBITUARY.

It is with regret that we have to announce the death of Mr. J. WATSON, Call Office Attendant, Hull. Deceased was an hon. member of the sergeants' mess of the Royal Garrison Artillery, which mess he visited on Saturday, Oct. 23 last, and expired suddenly shortly after entering. The Company lose a much respected member of the staff, who joined the Company in 1900 as Storekeeper and was transferred to Call Office Attendant in July, 1901.

STAFF GATHERINGS AND SPORTS.

Warrington.—Under the auspices of the district telephone society, a very enjoyable whist drive and dance followed the first meeting of the session at the King's Café, Warrington, on Oct. 27. There was an attendance of 63 members and friends, and the capital programme arranged met with the approbation of everyone present. The prizes were distributed by Mrs. Lightbown to the following winners:—Ladies: Mrs. Dean, Misses Hamilton, Mather, Magrath. Gentlemen: Messrs. H. Sherrington, J. W. Dean, Evans and Payne. Mr. F. W. Ashton acted as steward. Excellent selections of dance music were supplied by Mr. A. Starkey, and the duties of M.C. were undertaken by Mr. T. Taylor in a manner which left nothing to be desired.

Blackburn.—The male indoor staff held a highly successful social evening on Friday, Nov. 12. After dinner a programme of songs and recitations was gone through, and a whist drive took place in an interval, the winners being Mr. E. Brown (Contract Manager) and "Miss" Percy Duxbury. A welcome event, in which all participated, was a ping-pong tournament, and the finalists were Mr. G. H. Frost and Mr. Duxbury, the latter coming out top. Mr. G. Stevenson (Chief Clerk) presided, and the evening was voted the best ever held by the Blackburn staff. Mr. H. R. Robinson made an able accompanist.

Sheffield.—On Oct. 23, a football match was played between the National Telephone Football Club and the Office staff, resulting in a win for the Office staff by 3 goals to 1. As the weather was very unsettled only a very few spectators turned up to watch the game. Another game will be arranged before the end of the season, as the football club are anxious to regain the "ashes."

A Triple Contest.—A very interesting friendly contest took place on Nov. 12 between the staff of the National Telephone Company and the St. Wilfred's Catholic Club at the latter's club rooms. The contest consisted of billiards, shooting and whist. The two former items were won by St. Wilfred's Club, the results being five games against none, and 166 against 134 points respectively. The Telephone Company's staff beat their opponents at whist by 91 tricks against 81. After the contest appreciative remarks were made on behalf of the club by Messrs. Thompson and Cunningham, and these were suitably replied to by Messrs. Stokes and Bowring for the company.

Edinburgh.—The second of a series of whist drives was held on Nov. 12. Twelve tables were played, and the prizes, a pocket book, a vanity bag, and a rubber ball ("Something you can bounce about"), fell to Mr. Alex. Lumsden (Traffic Manager), Mrs. Lumsden, and Mr. R. Gilmour (District Manager), respectively. Some amusement was occasioned by these results. Mrs. Gilmour presented the prizes.

Portsmouth.—Last month a benefit smoking concert was held at the "Fratton Hotel," in aid of two distressed ex-employees. The venture was well supported, and an acceptable sum was handed over to the recipients. The following contributed to the musical programme:—Mr. Cobb, of the Post Office Telegraphs, Messrs. Albany, Legge, Padget, Pharo, Smitch, Yates, Watson and Welch.

Birmingham.—A football match took place on Nov. 6, between the District Office and Engineer's staffs. The result, 4 goals to *nil* in favour of the District Office, was not at all surprising, considering the form they displayed. Their combination and attack was altogether too much for their opponents, who were run completely off their legs, and had it not been for the fine defence of the Engineer's backs and goalkeeper, who brought off some fine saves, the score

would have been much heavier. Other departments are now challenging the District Office, so they look like having a lively time in the near future.

Amateur Dramatic Society.—The members of this society are to be highly congratulated on the success of the second performance of *Pygmalion and Galatea*. A wish had been expressed in various quarters for a repeat performance, and it was decided to give one in aid of the "Henry Stainsby Pension Fund for the Blind." The performance, which took place at the Moseley and Balsall Heath Institute on Oct. 26, was a splendid one, a local paper describing it as "one of best seen on the boards of the suburban institutes." Preceding the play, Miss Q. Payton, Senior Typist, delighted the audience with one or two graceful dances, and students from the Blind Institution gave a remarkable exhibition of pianoforte playing. The audience was large and appreciative. After the expenses, which were necessarily heavy in producing such a play, were paid, a sum of £3 was handed over to the Blind Institution, which was considered satisfactory. The above photograph represents last year's cast. The only changes this year are Mr. W. H. Roth (Mimos) and Miss N. Bolton (Cynisca) for the performers shown in the picture.

MIMOS (Mr. A. M. S. Thompson). LEUCIPPAC (Mr. A. Tilt). AGESIMOS (Mr. H. W. P. Wright). DAPHNE (Miss E. Braine).

CYNISCA (Miss N. Bower). PYGMALION (Mr. H. S. Silver). GALATEA (Miss E. Fisher). MYRENE (Miss E. R. Oakley). CHRYSOS (Mr. H. L. Brown).

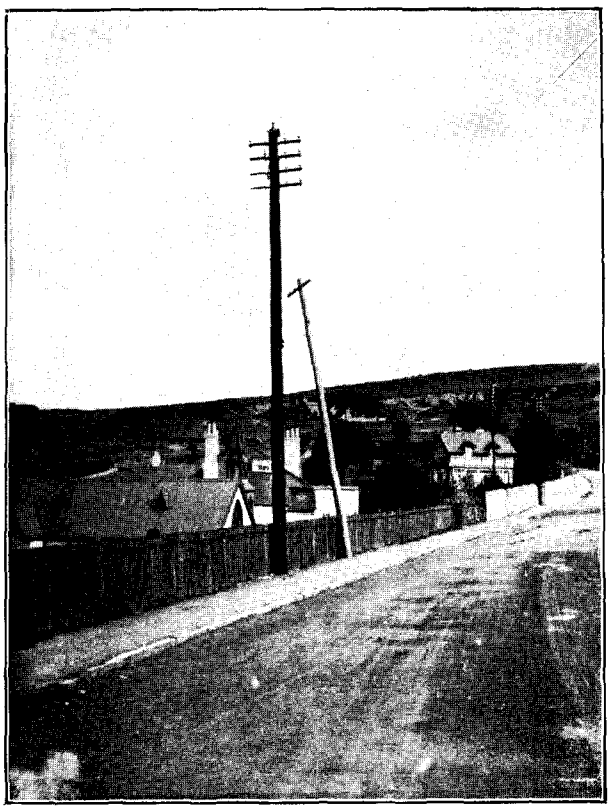
Bath.—A successful social evening was held on Nov. 6. A progressive whist drive and a concert were finished off by an enjoyable dance. Performers and audience consisted exclusively of members of the staff.

Chatham.—A football match was played at Chatham on Nov. 13 between teams representing Chatham and Maidstone staffs; the result was a win for the visitors, the score being 4 to 2 in their favour. The members of the Maidstone team were afterwards entertained to tea by the Chatham staff. This was followed by a smoking concert, at which a presentation was made to W. Lock, on his leaving the Company's service to enter the Metropolitan police.

Hull.—A smoking concert was held at the London Hotel on Oct. 29. It was well patronised by the staff, and was, taking it altogether, highly successful from a social and financial standpoint. Mr. A. K. Murray occupied the chair. The entertainment was provided chiefly by the staff, assisted by two professionals.

London.—The rivalry which exists between the night operators of the General Post Office and those of the National Telephone Company for supremacy in the field of sport was put to the test on Nov. 1 at Magdalen Athletic Ground, Earlsfield, when a team from each turned out to play a football match. Although the weather was foggy a good game was played by both sides, resulting in a win for the General Post Office by 5 goals to 2. A return was played at Regent's Park on Nov. 23, when the National Telephone Company managed, after a very exciting and well contested game, to turn the tables by a win of 3 goals to 1, the Post Office scoring in the last minute of play.

Bournemouth.—A social evening was held in connection with the society on Nov. 12, comprising lantern exhibition, dances and a musical programme, which latter was sustained by Messrs. Keniston, Skinner, Moore, Wilkens, and Young, and the Misses Brown and Guy, Mrs. Smith and Mr. Williams. The chair was occupied by the vice-president, Mr. E. Harper. Refreshments were provided, and a thoroughly enjoyable evening was spent. There were 66 present.



DIGNITY AND IMPUDENCE.

OUR Cheltenham correspondent sends us the above photograph. The tired-looking pole, it may be observed, does not belong to the Company.

LOCAL TELEPHONE SOCIETIES.

Birmingham.—The second meeting of the session was held at the Mecca Café, Union Street, on Nov. 2. The subjects were a discussion on "How Best to Develop the Company's Business," and "Is there a Tendency to Overdo the Use of Statistics?" The first was opened by Mr. Maclure, the Contract Manager, who was followed by a good number of speakers expressing their views and ideas on how, and how not, to do it. The second was opened by Mr. Lloyd and replied to by Mr. Tilt, various other members taking part. A prize was offered for the best arguments advanced during the evening, and this was won by Mr. Farrant, of Coventry.

Birmingham Operators.—The second meeting was held at the Mecca Café on Nov. 12, Miss N. Bowers presiding. Three-minute speeches were given by operators representing Central, Midland and Branch Exchanges. The subjects dealt with were as follows:—Miss Ivy Adams, "Operating 'B' Positions." "Miss M. Spiers, "Standard Expressions." Miss L. Harris, "Filtering Calls," Miss L. Cragg, "Operating at a Private Branch Exchange." Miss G. Banks, "The Perplexities of a Subscriber." Miss Fooks, "School Training," and a paper by the East operators on "Co-operation," which was read by Miss Joyner. The papers dealt with some important points in operating and were much appreciated. A short discussion followed. After the business meeting the members took part in a short whist drive.

Blackburn.—The fifth session of this society opened on Oct. 22, when the District Manager, Mr. C. Remington, read a paper under the head of "Notes on Traffic." The subject, which was illustrated by a fine set of diagrams applicable to exchanges in the Blackburn district, was fully treated and proved very interesting and instructive. A useful discussion followed. Refreshments were afterwards served and the remainder of the evening was given up to social intercourse, during which songs, instrumental solos, etc., were rendered by various members of the staff.

Bradford.—The first meeting was held on Nov. 10, with the president, Mr. G. W. Wicker in the chair. There was a good muster of members. A paper entitled "Methods of Testing" was given by Mr. F. Bastow, Test Clerk, Bradford, and proved interesting both to the clerical and electrical staff present.

Bolton.—The first meeting of the session took place on Oct. 28. The election of officers was proceeded with, the president, Mr. A. C. Haley, District Manager, being unanimously re-elected. Some discussion *re* the Head Office prize competition papers ensued. Three of the members have entered for this competition, two electrical and one clerical. The evening terminated by the exhibition of lantern slides kindly lent by the Cunard Steamship Company.

Bournemouth.—The second meeting of the session was held on Nov. 8, the chair being taken by the Local Manager, Mr. E. Harper. A paper was read by

Mr. F. W. George, Contract Manager, on "Contract Work," and an interesting discussion took place at the finish of the reading, in which Messrs. Howe, Hunt and Moore took part.

Brighton.—A meeting was held at Holy Trinity Schoolroom on Nov. 8, when an interesting paper on "Sub-Exchange Apparatus" was given by Mr. H. Summarsell. The subject was well illustrated by a series of diagrams, and an interesting discussion followed. A second paper on "Subscribers' Instrument, Line and Exchange Faults," by Mr. A. Brackley, should have followed this, but the discussion on the first-named paper proved so interesting that the latter was crowded out, and it will be given at a later date.

Bristol.—The second sessional meeting was held on Nov. 18, when two papers were delivered by Messrs. W. Roberts (Faultsman) and F. C Green (Engineer), on "Faults and their Remedy," and "Transmission from an Instrument Point of View" respectively. There was a large attendance, representing 70 per cent. of the staff, and a most interesting evening was spent.

Bristol Operators.—The second sessional meeting was held on Nov. 18, when a paper was given by Miss Edith E FitzGibbons, Travelling Supervisor, Bristol district, on "Enthusiasm." There was an attendance of 90 per cent. An interesting discussion ensued. Mr. Perkins, District Manager, occupied the chair.

Cardiff.—The first meeting of the session was held in the St. John's Schoolrooms, Cardiff, on Oct. 7. Mr. Dalzell, the president was in the chair. There was a very good muster. Mr. Eustace Hare, Assistant General Superintendent, read a paper entitled "Control," and his lecture was thoroughly appreciated by all present.

The second meeting of the session was held at the St. John's Schoolrooms on Oct. 21, Mr. W. J. Marsh being in the chair. A paper was read by Mr. E. Griffiths, district office, on "Stores." An interesting discussion followed, and the meeting was brought to a close with the usual vote of thanks.

Cardiff Operators.—The monthly meeting was held on Nov. 9. The chair was taken by the president, Mr. B. Waite. Two excellent papers were given entitled "Operating Irregularities: How they Arise," by Miss K. Warmington; "Their Effect, and How they May be Remedied," by Miss J. Hockey. Both papers were very interesting, and many important points were brought up, and a good discussion followed.

Chester.—The first meeting of the session was held on Nov. 8, when the Chief Inspector and his assistant conducted the members through the apparatus and switch rooms, and explained the working of the new central battery plant. Particular attention was paid to and interest shown in the method of operating.

Cornwall.—At a committee meeting held at Truro on Sept. 21, the following officers were elected:—Mr. G. Hooper, Plymouth, president; Mr. J. Wilkinson, Truro, vice-president; Mr. A. H. Mansfield, hon. secretary and treasurer, and the committee were elected as follows:—Messrs. W. S. Griffiths, F. A. Sowerby, H. W. Roberts, R. Harris, G. Chapple, A. Wotton and J. Gainey. A library has been formed out of part of the grant received from the Company, and Mr. C A. Solomon, Truro, has been appointed librarian.

The first paper was read by the president on Oct. 27, and was entitled "Working Expenditure."

Cork.—The first meeting of the session took the form of a "social" on Nov. 4. There was a very good attendance of the staff, over 40 being present. The Waterford staff were represented by Mr. E. Thomas, Local Manager. Tea was dispensed at eight o'clock, and a very enjoyable concert was held afterwards. The chair was occupied by Mr. F. Cowley, Superintendent for Ireland. The following officers have been elected for the session:—President, Mr. A. Lynn; vice-president, Mr. A. M. Kidd; secretary, Mr. J. O'Neill; treasurer, Mr. G. Henry; committee, Miss C. O'Regan, Messrs. J. Roy, W. Clifford, F. O'Shaughnessy and P. Clifford. The meetings are to be held every third Thursday, Nov. 25 being the date fixed for the next meeting.

Dover.—A most successful meeting was held on Nov. 9, in the St. James' Parish Hall, Dover, when Mr. A. E. Cotterell, Assistant Provincial Superintendent for the Southern Province, delivered an illustrated lecture on "The Development of Telephony—a 30 Year's Retrospect." There was an excellent attendance, representing 82 per cent. of the members, in addition to twelve visitors. The District Manager, Mr. C. F. Ashby, presided.

Dublin.—The second meeting of the session was held on Nov. 10, Mr. P. F. Currall, District Manager, being in the chair. A paper under the title of "Inside Maintenance from the Testroom Outwards" was read by by Mr. W. B. Haynes. An interesting discussion closed the meeting. In the November JOURNAL the prizes awarded to successful competitors of the 1908-9 session should have read: First prize (£1 1s.) to G. Kirkwood for his paper on "Sub-Exchange Construction"; second prize (15s.) to F. Scannell for his paper on "Ireland's First Central Battery Exchange"; and third prize (5s.) to J. Tyrrell for paper on "Inspections."

Exeter.—The first meeting was held on Oct. 26 with a full attendance, Mr. H. Reid being in the chair. Miss A. M. Lewis read a paper on "Operating Troubles," and the subsequent discussion was very animated, and was taken part in generally.

Torquay.—A meeting of the staff in this centre was held on Nov. 11, when it was decided unanimously to form a telephone society. The officers elected are president, Mr. H. Reid; vice-president, Mr. G. E. Williamson; secretary and treasurer, Mr. P. Hall; committee, The Misses Vanstone and Rowe and Messrs. Bovey, Brough, Gatting, Morgon and Robnett. It is hoped that the first meeting will be held at the month's end.

Gloucester.—The second meeting of the session was held on Nov. 18, the District Manager, Mr. C. Elliott, taking the chair. Miss Thomas, Travelling Supervisor, contributed a very interesting paper on "General Supervision," dealing amongst other points with the qualifications and important duties of operators at sub-exchanges, etc. Mr. R. H. Evans, Contract Officer, also read a most interesting paper on "Contract Getting." Both papers created very helpful discussion by Messrs. Norman, Ffrench, Sceats, De Medewe, Greenland, Berry and others.

Greenock.—The second meeting was held on Nov. 4, Mr. A. Ramsay Lamb, president, being in the chair. The lecturer was Mr. A. Bucklitsch, Chief Inspector, who delivered a most interesting paper entitled "Subscribers' Apparatus." There was a good turn out of members, and a discussion followed the lecture.

Hull.—The first meeting was held on Oct. 28, Mr. Worte, the District Manager, acting as chairman. A very interesting paper was given by Mr. F. D. Latimer, of the Head Office staff, who took for his subject "Description of the Manufacture of the Company's Dry-Core Cable."

Isle of Man.—The third meeting was held on Oct. 29. Mr. W. Kelly, Chief Clerk, gave a most interesting paper on "Stores Bookkeeping and Management of Stores and Tools." The paper showed clearly the need of the greatest care in these matters. An interesting discussion followed.

The fourth meeting was held on Nov. 19, the District Manager presiding, when a paper was read by Mr. J. Martin, Instrument Foreman, on "Switchboard and Test Board Wiring."

Leeds.—A meeting was held on Nov. 10; the percentage of members present reached 68. Under the heading "Competitive Subject, Office," six papers were submitted and read by members of the clerical staff upon various phases of office work.

Leicester.—The first meeting of the session was held on Oct. 22 at the Foresters' Institute. The evening was given to discussions on suggestions on matters of general telephonic interest, and the principal questions replied to were upon simple methods of transforming formulæ and the advisability of laying taper or straight cables in underground schemes. Mr. M. Marsden occupied the chair.

Liverpool and Birkenhead.—On Oct. 21 the two silver cups awarded by Mr. G. H. Robertson (which are competed for annually by the members of the Correspondence Classes) were, together with gold medals, presented to the winners by Mr. T. A. Prout, J. G. Whittle gaining one with 96·4 per cent. in the "D" Course, and H. B. Carroll the other with 100 per cent. in the "B" Course. Then the president gave a short address, after which a debate took place on the following proposition:—"Given the same amount of time and money, could a magneto system be designed to equal the latest common battery system." The advantages of common batteries were very ably brought before the meeting, and the magneto representatives made a very spirited defence. After the debate a great number of the members present gave their views, and it was evident from the ardent manner in which almost everyone participated that great interest had been aroused. When the question "Which side do you consider has by force of argument and eloquence made out the best case" was put to the meeting by the president it was found that the magneto's had obtained the support of a large majority. The result, which was received with applause, was due in the main to the operators present plumping for the representatives of the old system, influenced, no doubt, to a great extent by their long association with the magneto switchboard, and the eloquence of the speakers representing it.

London.—A general meeting was held on Nov. 3 in Hall 201, Salisbury House with an attendance of 170. Mr. G. Nicholls (Divisional Contract Agent, N.E.) was complimented on his success as winner of the prize competition so far as this society was concerned, and was duly called upon to read his paper on "Office." The following members took part in the discussion:—Messrs. W. F. Taylor, W. V. Pegden, E. Hare, — Webb, R. Bryson, J. Stirling, J. F. Edmonds, G. H. Walker, A. C. Greening, J. Marshall, W. Dowdall and Miss F. J. Minter.

London (Traffic Branch).—The second meeting of the session was held on Nov. 16, Miss F. J. Minter being in the chair. Two papers were read—"The Human Element in Traffic Matters," by Miss W. M. Etheredge, Traffic Office, and "The Value of Local Knowledge in Operating," by Miss M. Flinn, Avenue Exchange; 280 members were present. Both papers proved most interesting and were much appreciated. The following members took part in the discussions:—Misses Reekie, Newman, Berry, Minter, Buckwell, Etheredge and Messrs. Clay, Benham, Cohen, Mantle, Gill and Edmonds.

Luton.—At a meeting held on Nov. 15, an interesting paper was given on "Engineering Practice and Organisation," by Mr. H. J. Starkey, Assistant Engineer. The paper was illustrated by lantern slides and a model pole, etc. Mr Watts, of the Engineer-in-Chief's Department, was present and at the close of Mr. Starkey's paper showed some capital lantern slides illustrating the correct methods of carrying out details of line work, and also showed a number of actual cases which had been dealt with improperly. Mr. Watts emphasised the necessity of uniformity of practice, and also the importance of careful and neat workmanship. Mr. J. H. Wilson, District Manager, was in the chair, and the meeting numbered 70.

Manchester.—The second paper in connection with the above society was given by Mr. Latimer on Nov. 11, when he dealt with the "Manufacture of the Dry-Core Cables." A good number of interesting slides were shown illustrating the various methods employed in the making, drying and testing of both rubber and lead-covered cables, together with slides showing views of machinery in use by Messrs. Siemens and General Electric Company for the purpose of manufacturing them.

"*C.D.*" *Club.*—The Contract Department men have formed a club to be known as the "C.D. (Manchester) Club," and the first meeting was held at the Wheatsheaf Hotel on Oct. 25. Mr. Elliott, in the chair, said that with the inauguration of this club the men of the Manchester Contract Department were making history; that is to say, they were starting a new chapter in the history of

the telephone in this country, and therefore contributing to the development of the telephone service. Mr. Harris, the secretary, Messrs. Southern, Weldon and Butler spoke, and the proceedings were marked with a spirit of keen enthusiasm. The musical programme, which concluded the latter part of the proceedings, disclosed some excellent talent and was heartily enjoyed.

Newcastle.—The second meeting was held in St. Nicholas Café, Newcastle, on Nov. 2 before an excellent attendance of members, as well as a few visitors. Mr. J. Gwyther was in the chair. Two papers were given. The first on "Railway Wayleaves," was read by Mr. W. H. Abbott, and the second by Mr. M. T. Byrne on "Automatic *v.* Manual Telephony." An animated discussion followed, and was taken part in by Messrs A. L. E. Drummond (District Manager), J. Gilroy, J. Gwyther, O. Preston, G Marshall and others.

North-Eastern (London).—This society held its opening meeting at East Exchange on Oct. 25, when, after passing the rules governing the society, the chairman (Mr. J. Morley Ward) called on Mr. O. C. Crouch to read his paper entitled "Voltmeter Testing." The meeting was well attended by the various grades of the service,and it looks as if the session will be well attended and well appreciated.

Nottingham Factory.—The first meeting of the session took place on Oct. 25, 113 being present. Mr. Fenton, who presided, gave a short address, in the course of which he gave statistics showing the outputs for the various departments during the year, which proved of special interest to the departments concerned. A novel feature, so far as the Factory Society is concerned, was the reading by the official reader of six to ten-minute papers, the names of the writers of which were kept secret until after the men had voted as to which two were to have the two prizes specially offered for this competition. These proved most interesting, the following being the titles of the papers. The first two mentioned obtained the first and second prizes respectively:—"Screw-drivers" (illustrated); "The Making of Glue"; "A Simple Telegraph and How to Make It" (illustrated); "Description of a Dynamo"; "Transformers and their Use"; "Ten Minutes on Generators" Following this competition Mr. C. Hope's very useful paper was read on "The Need of Initiative," which should prove a stimulus to the members to strive to make themselves of greater value as workmen. The experiment of introducing short papers was fully justified by the success of the meeting.

Nottingham.—The first meeting was held on Nov. 3, in the Huntingdon Street Schools. Mr. E. Gaskell read a paper entitled "Application and Development of Power to Telephony," after which some discussion took place on the various points dealt with by Mr. Gaskell. Mr. Coleman, the president, took the chair, and subsequently presented the certificates gained by members of the Correspondence Classes.

Oldham.—The opening lecture was given by Mr. A. Pugh, District Manager, at the Café Monico, Oldham, on Oct. 21. The subject taken was "Traffic." The views of the lecturer were illustrated by a number of curves and diagrams, which rendered them very interesting to a large attendance of operators from the various centres in the district. The chair was taken by the president, Mr. W. B. Cheetham.

Plymouth.—The opening meeting took place on Oct. 20, when the president, Mr. R. A. Dalzell, gave an address, which was followed by an exhibition of lantern slides, lent by the Cunard Steamship Company, Limited.

A second meeting took place on Nov. 10, when two papers were read, one by Mr. R. G. Balle on "Inspections," and the other by Mr. F. Knight on "Fitting." These papers produced a bright and interesting discussion.

Portsmouth.—On Nov. 4 the session was opened, and a paper on the "Electrophone" was given by Mr. Pharo, Traffic Manager. The lecturer dealt with the history of the electrophone, and showed diagrams of the apparatus and methods of using it. The chair was taken by the District Manager, Mr. S. J Smith, and it was gratifying to see a good attendance of members.

On Nov. 11 Mr. T. J. Collins gave the second paper on "Electrical Units." This meeting was the first of a series in which the chairman is to be appointed from the staff to which the member who is giving the paper belongs. This lends a new interest to the proceedings, and it is hoped will be the means of some fully attended meetings during the coming session.

Sheffield.—The first meeting of the session was held at the Central Café, Sheffield, on Oct. 21, a fair number of members being present, and the president, Mr. F. Barr, being in the chair. After his opening remarks the president read his paper on "Telephone Societies, their Advantage, etc." This was followed by a paper, by Mr. S. B. Townsend, entitled "Subscribers," Mr. H. G. Rowe also reading his paper entitled, "A Short Talk on Private Branch Exchanges." All three papers were very well received, and considerable discussion took place at the conclusion of the papers.

Southern (London).—The general meeting of this society was held on Oct. 18, when the following officers were elected:—President, Mr. T. M. Inman; vice-presidents, Mr. G. H. Bryant and Mr. F. M. Ward; hon. secretary, treasurer and librarian, Mr. G. H. Cole; committee, Messrs. H. Baxter, L. Bignell, C. Head, J. T. Leete, A. Maltby and G. A. Payton. The general meeting was followed by the first lecture of the session, a paper being read by Mr. T. M. Inman on "Faults and Fault Localisation."

Stirling.—The second meeting of the session was held on Nov. 16, when Mr. Robt. Forrester, District Electrician, read a paper on "The Telephone Instrument." He dealt mainly with the points to be observed in fitting an instrument and maintaining it in efficient working order. A number of lantern slides bearing on the subject were afterwards shown.

Sunderland and Shields.—The session for 1909-10 opened by nineteen members of the society journeying to Newcastle on Oct. 5, to hear the lecture on "Some Intermediate Problems in Telephone Designs," by the Engineer-in-Chief (Mr. F. Gill).

The second meeting was held on Oct. 22, Mr. E. Spink presiding; the election of officers for 1909-10 being as follows:—Hon. president, Mr. A. L. E. Drummond; president, E. Spink; vice-president, W. J. Douglass; secretary and treasurer, J. Martin; committee, A. Livingstone, J. G. Dixon, A. E. Tinwell and R. Guthrie. Prospective membership, 23. After the election of officers and other business, an interesting discussion on the "Correspondence Classes" was raised by Mr. A. Livingstone. Mr. W. J. Douglass raised a discussion on "Telephone Work in Belgium" which was greatly appreciated by all present. The discussions were taken from the October JOURNAL.

Swansea.—The first sessional meeting was held in the Lecture Hall of the Public Library on Oct. 19, when a large audience, numbering over 100, composed of members of both societies, together with several visitors from the out-centres, spent a most enjoyable evening. The first part of the programme consisted of the presentation by the District Manager (Mr. W. E. Gauntlett) of the certificates gained by members of the staff in the Correspondence Classes of last winter. A most interesting lecture was then given by Mr. Gauntlett, entitled "Reminiscences," which was illustrated by lantern slides. The lecturer dealt with the advance of the telephone system from its earliest days, showing the great improvements which have been made in all its phases.

The second meeting was held at the Docks Exchange Hall on Nov. 17, when the following very interesting papers were read:—"Estimated and Actual Expenditure," by Mr. R. A Skinner (Cost Clerk); "Instrument Fitting," by Mr. W. Davies (Fitter); "How Cablegrams are Sent," by Mr. D. E. Wilson (Inspector).

Swansea Operators.—The second meeting was held at the Docks Exchange Hall on Nov. 10, Mr. W. E. Gauntlett occupying the chair, when the following very interesting papers were given:—"Operators' Irregularities from a Subscriber's Point of View," by Miss A. Elston; "Subscribers' Irregularities from an Operator's Point of View," by Miss L. Enright. The latter part of the meeting was devoted to the reading of "Some Notes on Standardisation of Operating Methods," by Mr. A. G. Bristow (Traffic Manager).

Tunbridge Wells.—The first meeting of the session was held at Ralph's Restaurant on Nov. 15, the lecture, "Motors," being given by Mr. H. F. Bates. The meeting closed with a vote of thanks to Mr. Bates proposed by Mr. W. F. Rathbone.

Warrington.—The first gathering was held on Oct. 29, at the King's Café, Warrington, the District Manager, Mr. H. Chambers, presiding over an attendance of 40 members. The president of the society, Mr. T. A Prout, Assistant Provincial Superintendent, delivered a very interesting inaugural address, emphasising the importance of the society, which would help the staff to exercise intelligence in their work.

Western (London).—The opening meeting of the session was held at Gerrard Exchange on Sept. 30 last when a paper on "Practical Cable Work: Its Development" was read by Mr. F. Dowdall. Lantern slide illustrations and a demonstration with a length contributed to a very interesting paper.

A further meeting was held on Oct. 28, and on this occasion Mr. W. A. Coolbear gave a paper on "Test Clerk's Duties at the Testing Table," which described the work in a large common battery exchange. Lantern slide illustrations were also shown in this instance and an interesting discussion ensued.

Weymouth.—A telephone society has been formed here. The first meeting was held on the evening of Nov. 11, at eight o'clock. The whole of the staff except those on duty attended, Mr. J. A. Attwooll, Local Manager and vice-president of the society, taking the chair. The lecture was given by Mr. E. S. Braithwaite (Chief Inspector) on "Party Line Systems," and was illustrated by blackboard and pencil diagrams. The lecture was most interesting, and was much appreciated by the staff present. The meeting closed at ten o'clock after a discussion on various points.

Wolverhampton.—The North Midland Telephone Society held their second meeting on Nov. 12 at the Midland Café, Wolverhampton, when Mr. E. J. Jarrett, Local Manager of Wolverhampton, gave an address on "Telephone Systems," illustrated by numerous lantern slides, a number of them being very kindly lent by the Engineer-in-Chief, and Mr. T. Prout, for the evening. The chair was taken by Miss M. E. Wylde.

Warrington.—The second meeting of the session took place on Nov. 17, when Mr. A. Magnall, Engineer, of Manchester, delivered a lecture, illustrated by a large number of lantern slides, on "Pages from an Engineer's Note Book." He pointed out the necessity of great care being exercised in running wires and taking down old plant, the value and use of lead-covered cable, and illustrated the new and better method of running aerial cable. The president, Mr. T. A. Prout, presided over an attendance of 40 members.

Paisley.—The second meeting of this society was held in Hutton's Restaurant, Moss Street, on Nov. 12, when a paper on "The Receiver" was read by Mr. Leithead. The paper was very much appreciated by a very good attendance of the members and a free discussion followed. Many questions were asked, all of which were satisfactorily replied to

ACHIEVEMENTS BY OPERATORS.

MISS GLADYS HEWITT DAVISON, operator, Blackburn, has qualified as a "marksman" at the Hornby Rifle Range, being the first lady in the Blackburn district to earn this distinction. She is only nineteen years old, and her qualification performance consisted of a score of 38 out of a possible 40 points. She is a member of a ladies' class at the range, which includes about a dozen members.

MISS ANNIE WINTERBOTTOM, a member of the Oldham operating staff, recently won the first prize in a 40 yards' open swimming handicap at Hollinwood. Miss Winterbottom quite recently won the first prize in a 120 yards' swimming race.

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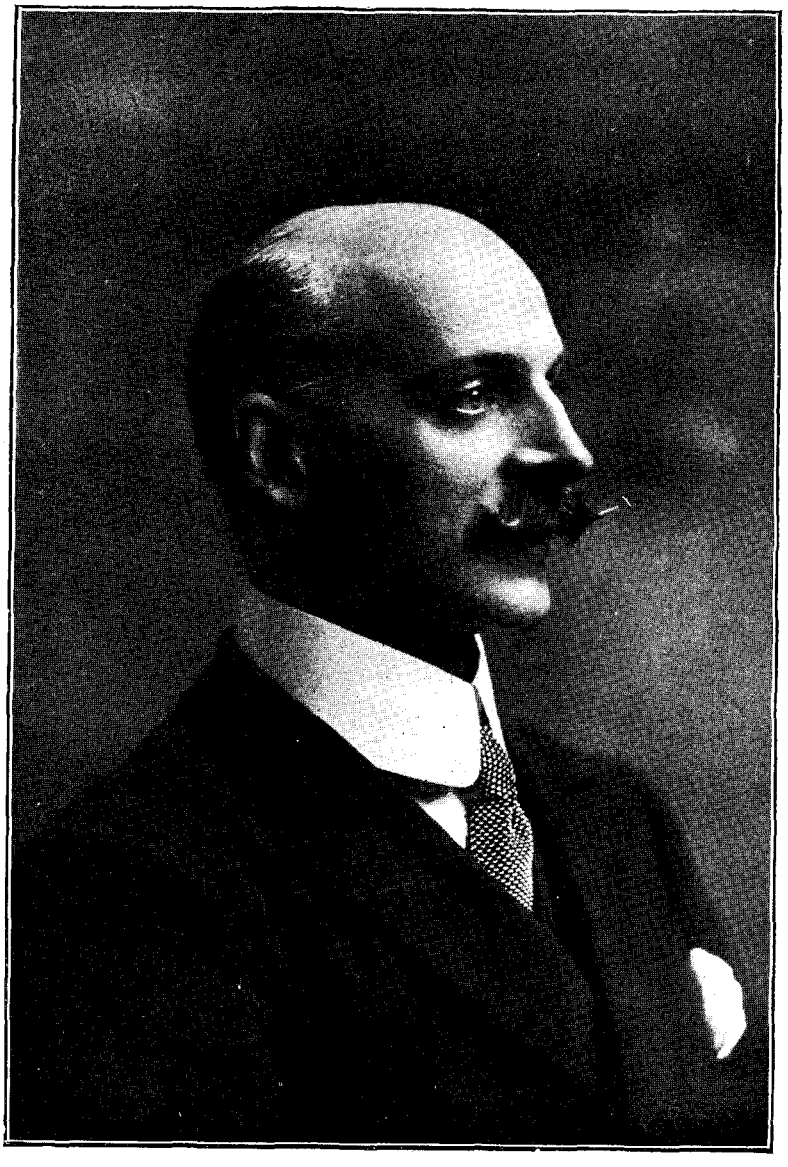
TELEPHONE MEN.

XLIV.—BENJAMIN WAITE.

BENJAMIN WAITE was born at Huddersfield, and educated at the Grammar School, Fartown, near that place. He entered the service of the Company as Inspector at Huddersfield on Aug. 26, 1887.

In those days an inspector's duty consisted of doing instrument work during the day and office work at night. At the time of Mr. Waite's entry in the Company's service, the old slipper jack switchboard was in operation, but within a few months he had the opportunity of fixing a multiple switchboard and dealing with the transfer of the exchange from one building to another.



On the transfer of the local manager from Huddersfield to Leeds he was left in Huddersfield as Inspector-in-Charge under the local manager at Dewsbury.

In 1891 he was transferred from Huddersfield to be Local Manager at Blackburn, which position he held for about eighteen months.

During this period he was under three district managers, viz., Mr. Sutcliffe, Mr. Dalzell, Mr. Gill, and on the transfer of Mr. Gill to Dublin he was given the position of District Manager in the year 1893. In May, 1894, Mr. Waite was transferred from Blackburn to be District Manager of the Eastern Counties. This district at that time comprised the country from the Wash to the Thames, and including Norfolk, Suffolk, Huntingdon and Cambridge, and the greater part of the county of Essex. In the whole of this district there were then only seven or eight exchanges, and during Mr. Waite's period of office in this part of the country 23 additional exchanges were opened. The work became too heavy, and in the year 1900 the district was divided, a district manager being appointed at Ipswich to take the southern part of the territory. In addition to the opening of these exchanges, seven of the existing exchanges were changed from earth to metallic circuit, leaving one exchange only, viz., Cambridge, earth circuit. Underground schemes were carried out both at Norwich and King's Lynn, and at Norwich two alterations in the exchange working were made. The first was a transfer from earth circuit to metallic circuit and call-wire working, and the second from call-wire working to lamp system of signalling and clearing. Strenuous efforts were made during this time to obtain support for an opposition system in Norwich; but with the assistance of the local director and by the introduction of a special rate practically the whole of the subscribers promised to the opposition were gained for the Company's system.

In May, 1903, Mr. Waite was transferred from Norwich to Cardiff, and on going to the latter district he had to carry out the decentralisation of Cardiff, three exchanges being opened in the suburbs of the city and eight new exchanges established. The reconstruction of the system at Barry, Penarth and Newport on an underground basis was carried out, and at Merthyr and Pontypridd by means of aerial cable work. At the present time the reconstruction of Cardiff is in hand, the underground work being carried out by the Post Office, the overhead work being dealt with by the Company.

Cardiff was one of the early districts to establish an operators' society. A society for the male staff also exists and both are doing most excellent work under the energetic guidance and assistance of Mr. Waite. He has just that method of helping and guiding those under him which makes for progress

and insures a full measure of interest being maintained and co-operation being exercised by all under him. That he has been elected Provincial Delegate for the Provinces on the Central Committee of the Staff Transfer Association shows that his methods and ability are also appreciated outside his own district. Mr. Waite has held office under no less than seven superintendents, and without exception has secured and maintained the high opinion of all. Cheerful and optimistic, even under the most trying circumstances, thorough, quick, but never hurried, he has gained not only the esteem and high opinion of the Company's officers and staff, but also, and in as great a measure, the esteem and confidence of a public not easily satisfied.

THE TELEPHONE ENGINEER AND HIS QUALIFICATIONS.

By E. STANLEY BYNG, A.M.I.E.E.

TELEPHONY has developed so rapidly during the last decade that a thorough training is now an absolute necessity to enable the engineer to deal adequately with the complicated technical and other problems with which he has to cope. In the telephone business of to-day the possession of a trained intelligence is a desideratum which cannot be dispensed with, and it will no doubt be interesting, and perhaps helpful to some, to consider what course an apprentice or junior engineer should pursue if he is to achieve success in his chosen career as a telephone engineer.

Technical education has reached a high standard of excellence at the present time, and its advantages are within easy reach of every one. Yet, in spite of this, and of all the advice that has been given on this subject, it is astonishing how few men who, for their own sakes, should be doing their utmost to fit themselves for high and responsible positions, have the energy or initiative to avail themselves of the great opportunities offered them. No time is better spent than that devoted to the training of the mind, especially at that period at which it most readily responds to the acquirement of knowledge; it avoids the danger of intellectual idleness with its evil consequences, which it is considered is a serious tendency of the present day. Many of the elementary subjects learnt at school are afterwards forgotten, and have often to be re-learnt with much expenditure of time and labour.

In almost every town of our country technical schools and evening classes are organised to conduct a variety of courses of study. There are thus many opportunities given for continuing one's education; but a student who wishes to benefit by these opportunities must possess, besides a certain amount of ability, both energy and perseverance. As, however, attendance at these classes is not compulsory, there is perhaps a danger that the student who begins well may, through lack of interest at a crucial point in his studies, omit classes here and there until when examination time comes he makes a very poor show.

It would, perhaps, be advisable at this point to indicate what subjects may be studied with advantage in order to get the all-round technical knowledge desirable. The following recommended subjects are given in the order of their importance:—

Practical mathematics. Stages I, II and III.
Magnetism and electricity. „ „ „
Telephony. Ordinary and honours.
Telegraphy. „ „
Electrical engineering.
Mechanics.
Machine drawing and construction.
Chemistry.
Physics.

It is hardly possible adequately to draw up a curriculum or scale of study, for so much depends upon a man's previous education, the time that can be devoted to study, and his physical fitness, etc. A student should not, it is thought, spend more than three evenings a week at class work; he will then have time on his free evenings to re-write his notes, work out the problems set, and to read up the subjects he is engaged upon. These facilities can, of course, be enjoyed only by those whose work or home is not too far removed from the place of instruction; but in these days of educational enterprise comparatively few would be thus debarred.

The Correspondence Classes conducted by the Company form an excellent means of home education, and whether taken up alone or in conjunction with oral classes they should undoubtedly be more widely utilised, as much of the information contained in the advanced papers cannot be obtained elsewhere. The Company have done, and are doing, so much in the way of grants, payment of fees, etc., to encourage the staff to be industrious, and to qualify for higher positions in the telephone service, that employees must, in fairness to themselves and to the Company, avail themselves of these opportunities. During the summer months it is recommended that a practice of looking up what has been previously mastered be adopted, or the knowledge gained becomes somewhat dimmed by the time the winter session is commenced. After some five or six years the engineer should be in a position to discontinue the recognised classes, and then keep himself up to date by attendance at the various meetings held by the telephone societies, and by a systematic reading of technical books and periodicals.

There are many, probably, who will not appreciate the thought of giving up various pleasures and amusements for so long, but as one grows older and life's responsibilities increase, one's leisure time becomes occupied by many small and varied calls, so that the concentration and steady application necessary for serious study is difficult and sometimes impossible to maintain; it is, therefore, much better that the sacrifice, if sacrifice it may be termed, be made early in life.

It is very essential that the engineer should also be a practical man, and not *merely* a paper strategist. To secure the practical training required, while attending the technical classes, he should take every opportunity of making himself so familiar with all the details of the Company's construction work, that, if necessary, he could competently take personal charge of any of the many varieties of work he may be called upon to supervise. A great deal of ingenuity can be displayed under varying circumstances in the adaptation of the Company's material to the best advantage, having due regard to economy, efficiency and appearance. Considerable forethought has to be shown in dealing with the design of the Company's plant so that the same is utilised to the best advantage; and this is where real engineering skill is required. Unless future developments are thoroughly considered it is impossible to have an economically constructed telephone system, for "rule of thumb" methods only lead to unsound engineering.

The engineer must realise the necessity of thoroughly understanding and of taking into consideration every detail of any contemplated work so that the estimate which he is required to furnish may be accurate, and set forth in such a manner as may be easily understood and worked to.

Technical men are not usually strong in their knowledge of the English language, and yet the importance of being able to speak and dictate fluently and correctly cannot be overestimated, for a very slight variation in the wording of a letter, specification or instructions may mean much. Then again, how much more pleasant it is to read a letter properly written than one compiled in a slipshod way. In dealing with the public, a man of good address and having a good vocabulary at his disposal is much more likely to be favourably received than one who does not wisely choose and speak his words.

The telephone engineer necessarily combines many essential functions, and if a higher standard of all-round efficiency were aimed at, there is no reason why the man of average intelligence and determination should not succeed, for there are many good positions in the Company's service open to capable men, who are certain of success if they are appreciative of their opportunities, and alive to their own and the Company's interests.

THE MONEY VALUE OF ONE DAY'S TELEPHONE SERVICE.

THE *Electrical Review and Western Electrician* states that a suburban telephone subscriber in the Boston district of the New England Telephone and Telegraph Company took occasion recently to determine the actual value of one day's service in connection with his business. During this day he called up eight persons from his

own telephone, received five incoming calls, and called three times in the transaction of business on other lines than his own wire. The actual cost of this use of the telephone facilities of his community was 1*s.* 2*d.*, the rental of his own instrument being 4*d.* and the in-and-out of town charges 10*d.* Assuming that the transaction of business took the same time over the telephone that it would have in a personal visit, and allowing one minute per call to obtain the desired person, it was found that the use of the telephone made a net saving of three and a half hours, compared with the actual time it would have taken under the most favourable circumstances to make the rounds of the different parties in a well-planned trolley and steam railroad circuit. To have visited the called parties in person would have necessitated travelling 25 miles inside the Metropolitan district, at a conservative cost of 2*s.*, and this time would have been largely wasted so far as productive work went. This business man's time happened to be worth approximately 5*s.* per hour, so that the actual net saving in the day's use of the telephone was 18*s.* 6*d.* This was made up as follows:—Credit to telephone, three and a half hours at 5*s.*, and fares for 25 miles; total, 20*s.* Debit to telephone (cost of service), 1*s.* 6*d.* Net saving, 18*s.* 6*d.* The results clearly indicate that even to the man of small means the telephone is a definite money saver, and that its yearly net value to even a moderate-sized community may rightly be expressed in millions of dollars.

THE NEW COMMON BATTERY EXCHANGE.—ABERDEEN.

By H. S. THOMPSON, *Engineer-in-Chief's Department.*

THE common battery system which was inaugurated in England in 1900 at Bristol has now penetrated as far north as Aberdeen, where on Saturday, Nov. 13, a standard No. 1 equipment was brought into use. It would seem, therefore, that if henceforth we speak of the common battery system as having spread from Land's End to John O'Groat's our claim will not be altogether without foundation.

Prior to the reconstruction Aberdeen was served mainly by an overhead earth circuit call-wire system with three exchanges—Central, Western and Kittybrewster. Of these the first two were equipped with flat type switchboards, and the latter with standard floor pattern 50-line magneto boards.

The old overhead plant has now been replaced by a modern metallic circuit underground cable system, with open wire distribution in accordance with the Company's usual practice in such cases.

The common battery exchange equipment, which was supplied and installed by the Western Electric Company, is housed in a new fireproof building specially designed for the purpose situated in Bon Accord Street. Of this building Mr. Leonard Stokes, of Great Smith Street, Westminster, is the architect.

In most minds the name Aberdeen is closely associated with granite, and in compliance with the local requirements the external walls of the new building have been constructed entirely of that material. The front elevation from the ground to the first floor and the centre portion of the first and second floors is of pink granite, and all the rest of the building of grey. Viewed from the street the building presents an imposing and dignified frontage well worthy of the important service with which it is associated. A photograph of the building is reproduced in Fig. 1.

The ground floor is wholly occupied by the district offices, to which direct access is gained from the entrance hall. A general view of the outer office is shown in Fig. 2.

The full extent of the basement, with the exception of two small rooms partitioned off to accommodate the heating plant, is allotted to the stores. Below the basement is a subway where the cable ducts from the street terminate and in which the pumping plant for use in connection with the underground cables is installed.

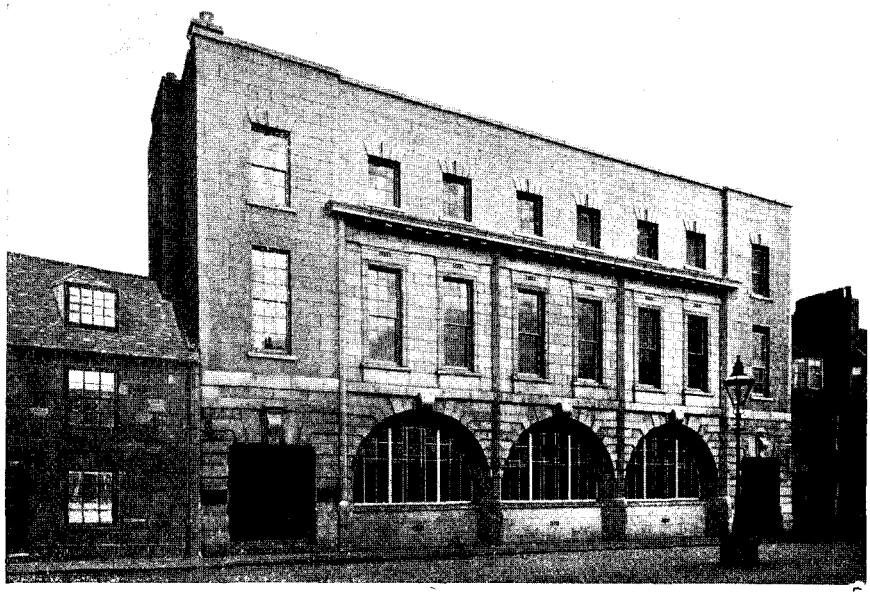


FIG. 1.

The method of leading in the underground cable and carrying them up to the vertical side of the main frame where they terminate is similar to that adopted at the Midland Exchange, Birmingham, which has been fully described in the earlier issue of the JOURNAL.

On the first floor are located the apparatus room, battery room, the local manager's office, service testing room, drawing office, inspectors' office, and cloak room and lavatory for the male staff. The arrangement of the rooms on this floor and the lay-out of the apparatus room is shown in Fig. 3. Fig. 4 is a view of the apparatus room showing the power plant and a portion of the main

FIG. 2.

distributing frame. It will be seen that the standard lines of design for No. 1 equipments have been closely adhered to.

The main distributing frame has capacity on each upright for 300 lines. Carbon arrestors, heat coils and fuses are fitted on each line entering the exchange.

The power plant consists of two motor generator charging sets and one motor generator ringing set, running off a 440-volt continuous supply, and one ringing dynamotor running off the 24-volt battery. These machines are all of standard design

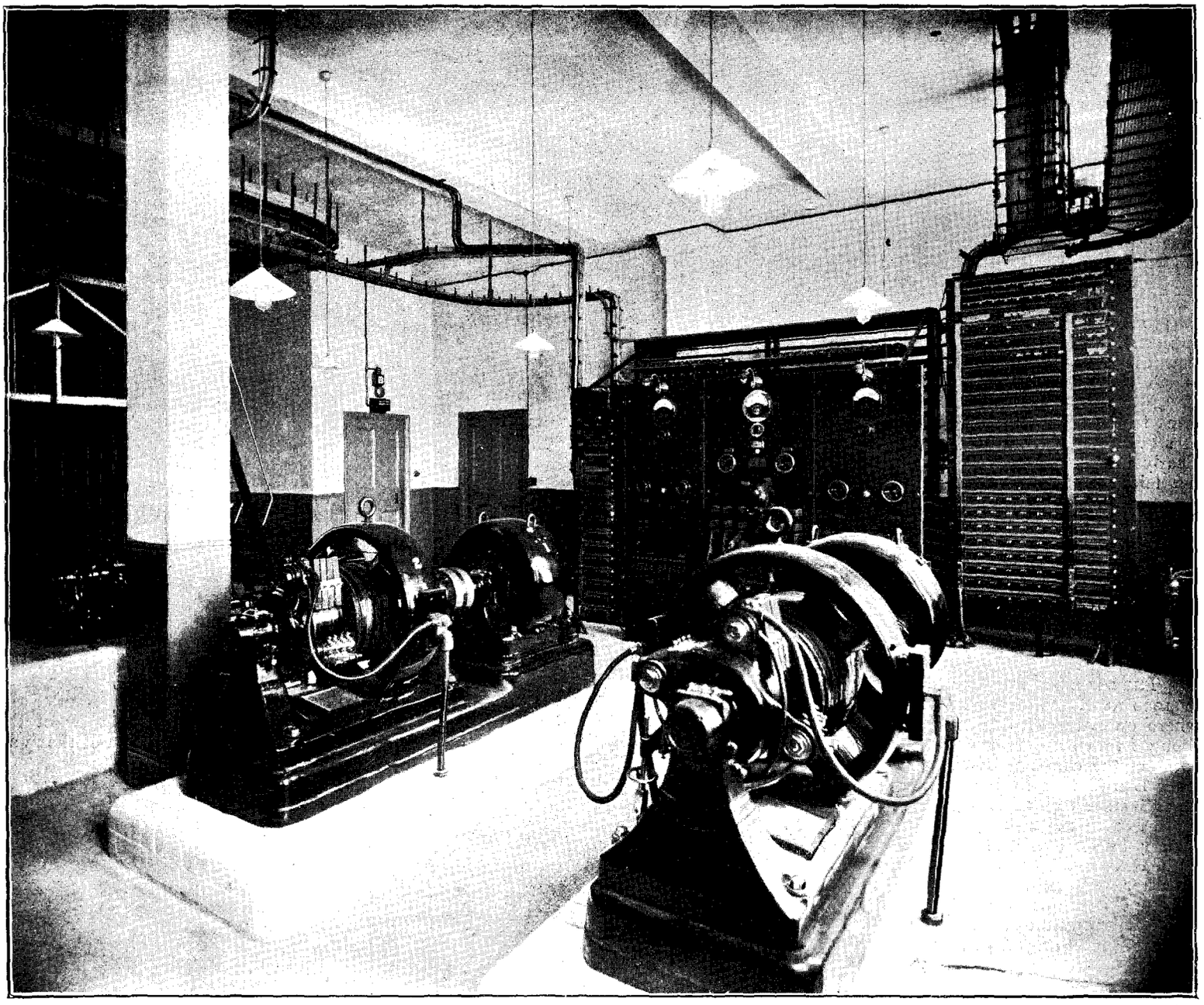


FIG. 4.

and are similar to those installed in other common battery exchanges.

Duplicate supply mains are brought into the building in order to minimise the risk of breakdown due to failure of supply, and change-over switches are provided in the switch chamber.

The main battery was supplied by the Chloride Electric Storage Company, and consists of eleven cells of the C.M. type, the register battery consisting of four cells of the S.G. type of the same company.

In the service-testing room a single position desk is fitted. Fifty standard service-testing circuits have been wired on this desk, but only 40 are equipped at present.

On the second floor are the switchroom and the operators' quarters. Fig. 5 shows the general arrangements. Fig. 6 is a view of the switchroom. Here, again, the results of standardisation are very noticeable in the similarity between this view and views of various other No. 1 common battery switchrooms which have appeared in previous issues.

On Fig. 5 a room will be noticed adjoining the switchroom, marked "school." At present no equipment has been installed for this purpose, but the accommodation is provided in order that a school equipment may be installed at a later date, when the requirements of the service justify it.

A view of the operators' sitting room is shown in Fig. 7.

In respect of circuits, apparatus and working arrangements, there are no innovations to be described, the equipment throughout conforms with the standard No. 1 design with which most readers of the JOURNAL are now familiar.

The building is heated throughout by means of hot water pipes. A separate hot water system is installed for supplying the kitchen and the various lavatories.

Electric lighting is employed and is taken from the Corporation supply which is a continuous current three-wire system with 220 volts, across the "inners." Wherever economically possible 110-volt metallic filament lamps, arranged for series running, have been installed.

Incandescent gas lighting is provided in case of failure of electric supply.

The time service throughout the building is maintained by the

FIG. 6.

usual electric dials, controlled by a master clock installed in the apparatus room and fed from the common 24-volt battery.

The following are some of the more important figures relating to the present equipment:—

Main Frame.

Total capacity horizontal side 6,160 lines.
Total ,, vertical ,, 8,400 ,,

Intermediate Frame.

Total capacity horizontal side 9,000 lines.
,, vertical ,, 9,000 ,,

Relay Rack.

Total capacity present rack, line and cut-off relays	3,800
,, ,, resistance spools ...	200
,, ,, long junction equipment or miscellaneous...	100

Register.

Equipped operators	48
,, subscribers	900

Switchboards.

"A" positions equipped	23
"B" ,, ,, ...	3
Testing ,, ,, ...	1
Lines per "A" position	140
,, ,, "B" ,, ...	27

Power Plant.

Charging machines	300 amperes at 30 volts.
Ringing machines	150 watts.
Main battery	1,700 ampere hours on nine-hour discharge.
30-volt battery	480 ampere hours on nine-hour discharge.

Working Lines at opening.

Subscribers	2,307
Junctions	50

As the method of making the transfer was rather different from that usually employed, a few notes on the subject may prove of interest.

As was pointed out in the first paragraph, the old system was, except in a few isolated cases, worked by earth circuit and call wires. When the new underground scheme was laid out it was found that in almost all cases the route of the existing wires on

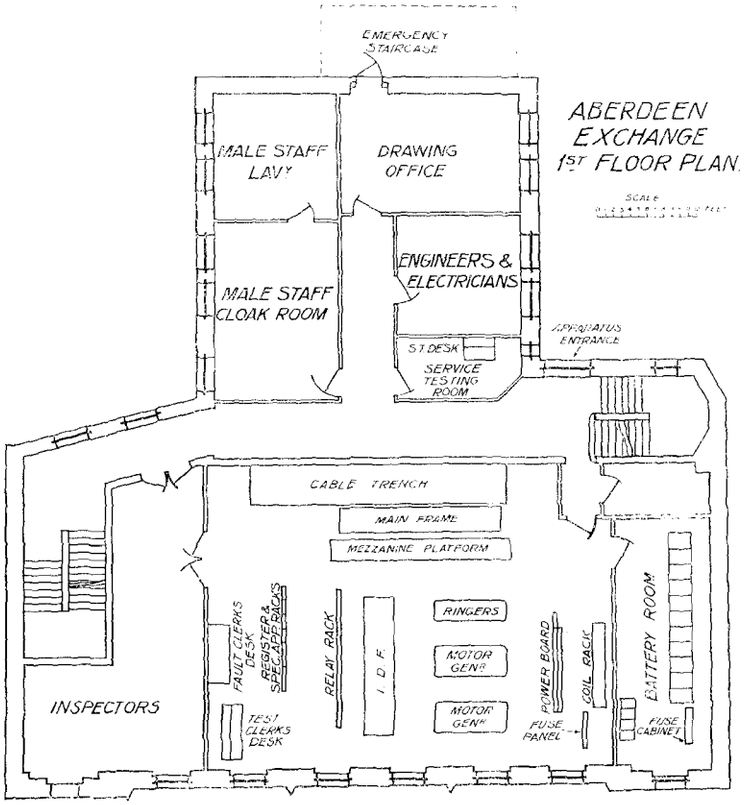


FIG. 3.

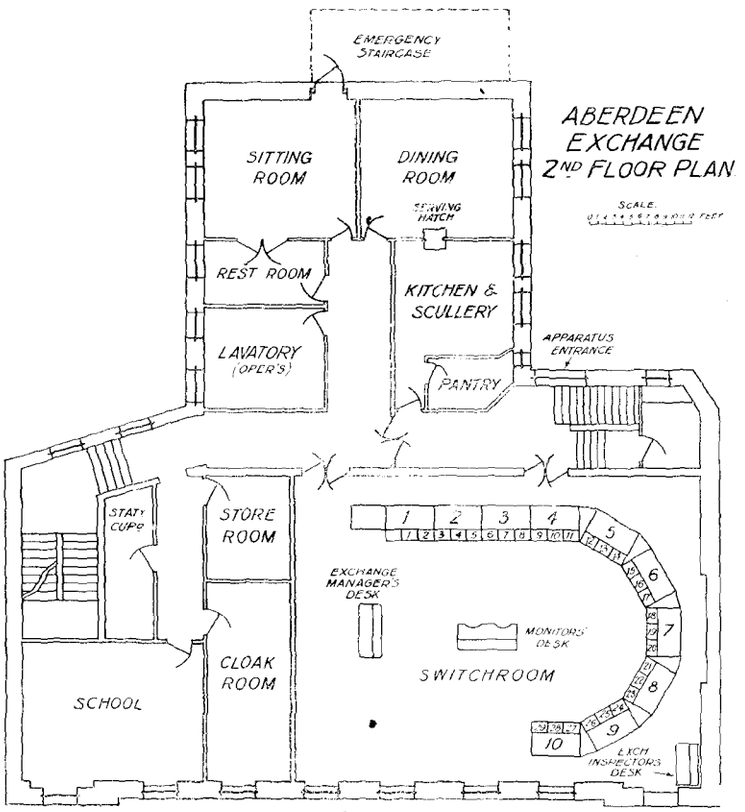


FIG. 5.

leaving the subscribers' premises was such as to necessitate new loops from the distributing poles right up to the vulcanised india-rubber leading-in wires. In addition it was necessary to rewire the subscribers' offices.

FIG. 7.

After careful consideration it was decided to fit new common battery instruments in all these cases alongside the old call wire sets, and it was thus possible to complete the new installations right from the instrument up to the common battery switchboard without interfering with the existing exchange lines. Prior to the change-over notices were sent out to these subscribers notifying them that at a certain hour they were to cease using the old instrument, and from thenceforth use the new one. This left comparatively few lines on which actual changes had to be made at the transfer, and greatly simplified the work on that day.

Unfortunately, however, Aberdeen was visited by a heavy gale on the night preceding the transfer, followed by a 3-inch snowfall the next day. This resulted in a good many of the old earth circuit lines being brought down across the new distribution work, causing earths or short circuits. Apart from this trouble, which was promptly tackled and cleared out with all possible dispatch, the change-over was successfully accomplished.

Since the change-over the new equipment has been working quite smoothly, and it is understood the improved service is giving great satisfaction to the subscribers.

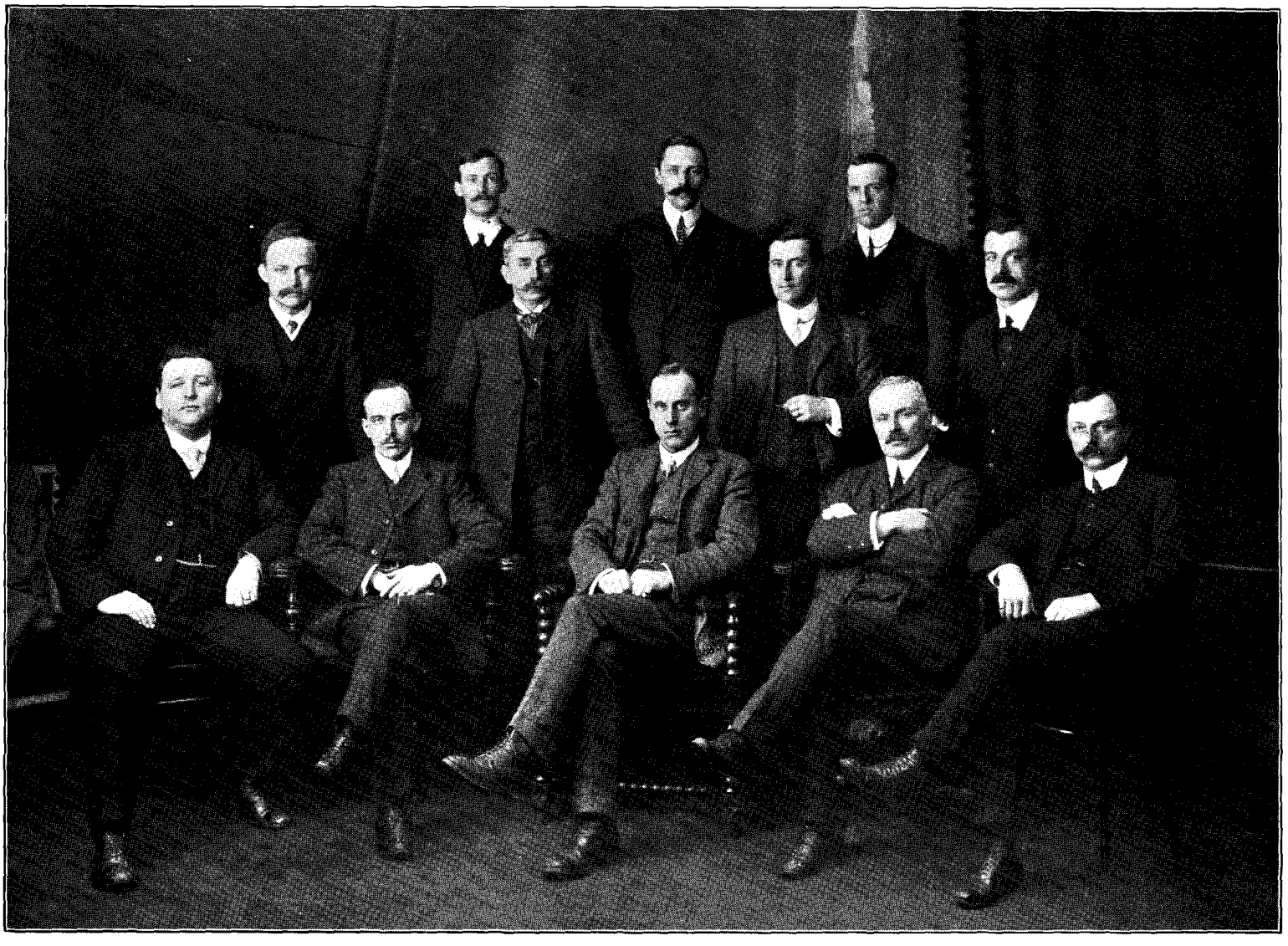
In conclusion, one cannot help calling attention to the happy phraseology of the Company's new Aberdeen address, and welcoming the same as an omen of the increasing "Bon Accord" between the Company and its Aberdeen subscribers which it is hoped will result from the improved service.

POST OFFICE INSTITUTE OF ELECTRICAL ENGINEERS.

THE following further papers read before the above institution are now obtainable at the prices mentioned:—

"Underground Telegraphs." G. H. Comfort ... 6*d.*
"Wireless Telephony." R. Lawson ... ... 9*d.*

Application for copies of these should be made with remittance to the Engineer-in-Chief, Head Office.



F. W. HIBBERD. F. BLICK. F. W. GEORGE.
C. A. JACKSON. A. BASCOMBE. E. W. NEWTON. C. W. APPLEBY.
C. E. TATTERSALL. F. G. C. BALDWIN. J. M. SHACKLETON. J. L. BROWN. J. A. HUNT.

LONDON AND ITS ORGANISATION.

BY J. STIRLING, *Metropolitan Chief Accountant*, AND J. M. SHACKLETON, *Metropolitan Engineer*.

ENGINEERING.

THE engineer is looked upon as the aristocrat of the industrial professions. The very name has a high-sounding attractiveness, which probably accounts for the readiness with which so many men assume the title without even a modicum of qualification. The scope for his energies has widened immensely within recent years, and nowhere is this more evident than in the domain of electricity. A wise lexicographer defines an engineer as "one who constructs roads, railways, etc." A good many branches of engineering work care covered by that comprehensive "etcetera," ours not the least of them.

Writing early last century, Emerson described the bias of the English nation as "a passion for utility," and added what to us, three generations later, must seem strange words—"Now their toys are steam and galvanism." The passion still remains, and has through the process of the years converted the seeming toys of the philosopher into beneficent servants of mankind. The evolution of some great discovery from humble gropings in the darkness until it emerges into the full light of day is a study which never fails in interest. Telephone work is replete with such fields of enquiry and research.

Those of us who have spent our best years in the service can see how gradually, yet how surely, telephone engineering has come into its own; how the rule of thumb, the arbitrary methods of our youthful days, have been gently but firmly surperseded by and developed into the more intelligent and efficient ways of the scientific era which now holds sway in our technical departments. This change is perhaps more evident and pronounced in our outside engineering than in any other branch.

London, above all cities and districts, stands to gain from the results of the modern school of telephone thought. Its vast size, its complexity, its special characteristics, demand for the solution of the problems which they raise that combination of science and practical experience, blended with common sense, which we now seek for in our engineering staff.

The 640 square miles of area controlled by the Metropolitan Engineering Department covers a district exceptional in its great variety of territory, population and buildings, and in the fact that a considerable portion of it is in a constant state of transition.

First, there is the City proper with its vast blocks of offices—its immense warehouses, its broad, busy thoroughfares, its numerous alleys and byways—forming together a curious and interesting medley of ancient and modern. Then there is the West End, with its palatial hotels and extensive system of flats; the East End, with its busy docks and wharves forming the foreground to a sordid array of mean streets where crowd the dwellings of the poor; and the ever-extending suburbs, unceasing in their task of supplying the

housing needs of the City workers. Finally, there are the rural areas, including the beautiful Surrey country and the flat Essex lands, where the din and turmoil of London seem but a memory of "old. unhappy far-off things."

That the needs of those who dwell within so immense and diverse a realm can only be met by the exercise of much forethought and intelligence goes without saying.

For purposes of administration, London is divided into seven divisions, each of which is under the immediate control of a

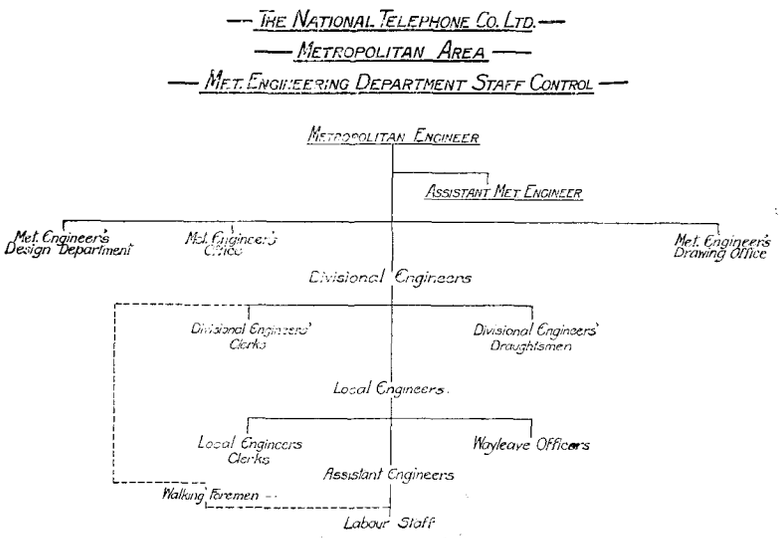


Fig. 1

divisional engineer. The arrangement and organisation of these divisions is given graphically on Figs. 1 and 2, the former showing the relationship of the various grades to each other and to the controlling centre; and the latter the territory covered in each division by the engineering officers. We are glad to be able to show a group of these officers at the top of this article.

The work of the engineering headquarters at Salisbury House is divided into three sections: Design, clerical and drawing. The first of these is undoubtedly the most important, particularly in view of the closer study which has been given during the last few years to everything pertaining to the provision of plant. And let it be noted that the term "Design" is here used, not only in relation to constructional details, but more particularly in reference to the most efficient and economic lay-out of plant as a whole. Through this department pass all matters relating to transmission, development and economics. It undertakes all investigations in connection with the position of new exchanges, modifications and additions to plant, the checking of all estimates sent in by the divisional engineers, and generally exercises that forethought which is necessary in the design of the plant throughout the area.

Owing to fluctuations in the amount of work in each of the seven divisions, it has been found necessary to have a central officer to act as "staff transfer agent." The Metropolitan Engineer's chief clerk, in addition to his ordinary work fulfils this duty. He keeps in touch with the divisional engineers constantly, and watches the returns of outstanding orders. He is thus in a position to know in what division more staff is required, and whence it can best be drawn. This arrangement has materially improved the mobility of the staff, as gangs, jointers, wayleave officers and assistant engineers can be interchanged as circumstances demand.

The drawing office, in addition to carrying out all drawing work for the Engineering Department, executes the drawings required by the other departments in London. An average weekly total of something like 30 drawings and 1,000 prints is turned out. As far as possible, all drawings have been standardised as regards size of paper, symbols, codes and style of lettering; the divisional engineers' draughtsmen also work to the same rules. The standards chosen generally coincide with those in use in the Engineer-in-Chief's office. It is thought that some uniform standardisation of this description might be introduced universally, and with the same advantages as have accrued to London. A special arc lamp printing set is in operation, and a blue print can be supplied from any tracing ready for use at about five minutes' notice.

With a staff numbering nearly 1,000, and scattered over so wide a district, one difficulty is the dissemination of information and instructions in such a manner as to secure that uniformity of working which is so desirable, and so necessary to efficiency. In addition to the issue of numbered circular letters, embodying the procedure and regulations regarding important matters, the most effective aid to co-ordination of results is the monthly meeting of divisional engineers, when consultations, interchange of ideas, and discussions on various phases of the work are engaged in. Many useful suggestions have been forthcoming at these gatherings.

In status the divisional engineer occupies a position akin to that of a district manager. He is regarded as the senior officer in his division. He deals direct with Head Office on such matters as special wayleave agreements; is responsible for all letters and communications regarding the completion of new lines and removals: for sending in to the Chief Accountant monthly estimates of the capital and revenue expenditure required in his district, and for the payment of petty cash expenses to all departments in the building where he is stationed.

In order that the office work done by technical officers may be kept at a minimum, an adequate clerical staff is provided at each divisional and local engineer's office, relief for sickness, holidays and times of special pressure being met by drafts from the Chief Accountant's office. Each divisional chief clerk is responsible for keeping up to date and in order, not only the work of his own office, but also that of each local engineeer's office in the division.

Works orders are issued direct to each local engineer. For keeping in touch with work in hand, a distributor, consisting of a small cabinet divided off into compartments, is used, and all uncompleted works orders must be kept there. An extra works order

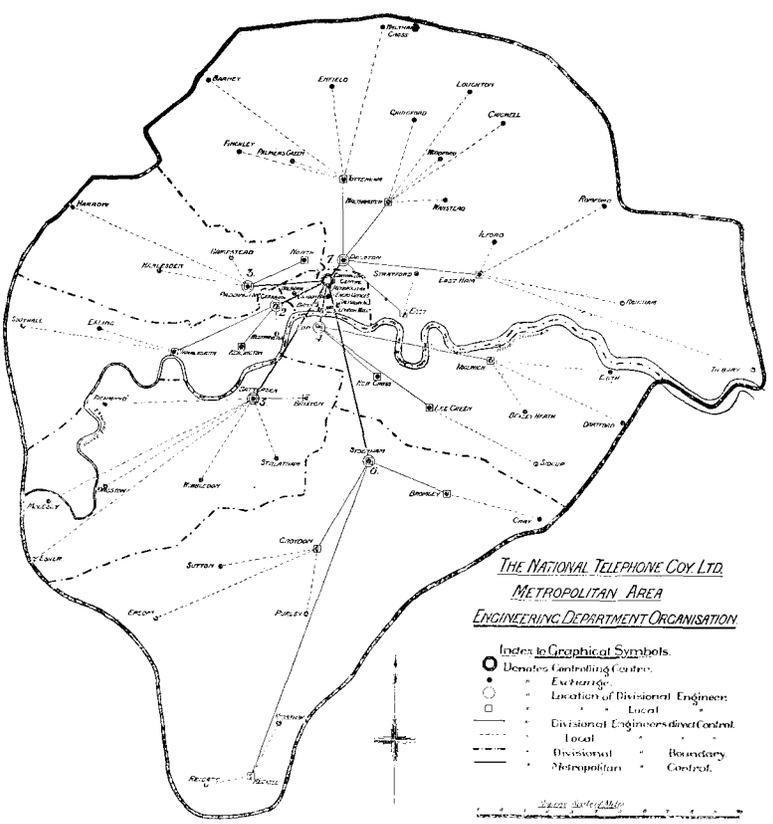


Fig. 2

slip is sent by the issuing office to the engineer in cases where outside work is necessary, so that he may have for reference a copy of all works orders on which his foremen are engaged; one compartment in the distributor is allotted to each foreman for facility of reference. After a works order has been completed, the additional slip is filed at the local office, and is useful if an enquiry is subsequently raised.

(To be continued.)

TELEPHONE WOMEN.

LV.—FANNY LOUISA HOLMES.

MISS HOLMES is at present in charge of the local and trunk fee branch in the Rentals Office, London. She originally entered the service in July, 1888, but had a slight break between January, 1895, and November, 1896, having had to resign on the former date through ill-health. Miss Holmes' first experience in the service was as an Operator at the "Queen Victoria" Exchange, now designated "Bank." She has many strange reminiscences of those old

FANNY LOUISA HOLMES.

operating days, and of the contrast between the traffic conditions of to-day and those of twenty years ago. The clerk-in-charge of a busy modern exchange in these times must feel rather envious of the conditions that obtained in 1888, when the lady in charge at "Queen Victoria" spent most of her time reading and preparing her *trousseau*. In 1892, on its being decided that the boys who had hitherto operated the Central Exchange in London were to be replaced by girls, Miss Holmes was transferred to fill one of the posts thus created. The exchange was situated at Oxford Court, Cannon Street, then the Head Office of the Company. The trunk service had not at that date assumed anything approaching the gigantic proportions of to-day, the whole of the trunk calls from London being accommodated on two lines to Liverpool, and one each to Birmingham, Manchester and Brighton.

In November, 1896, when Miss Holmes rejoined the service after an illness, she was appointed a Clerk in the Traffic Superintendent's office. By this time the trunk lines had been handed over to the Department, and in June of the following year Miss Holmes was given charge of the Post Office accounts. In July, 1897, the number of these sent out in London was 2,500, and the number of items posted 16,300. At the present time the accounts number 20,000 per month, and the number of items posted 135,400. In January, 1905, Miss Holmes was transferred to Salisbury House on the reorganisation of the Metropolitan staff. There she remained in charge of the Post Office account work, and in 1907, when the ticket system was commenced for message rate subscribers, the sorting and analysing staff were also placed under her control. Miss Holmes is a strong believer in the promotion of juniors to vacancies as they arise, and does all in her power to train the clerks under her charge to fill better positions. She confesses to no particular hobby, though some of her friends assure her that it is "tickets." To this Miss Holmes admits that her chief interest has always been in her work, and that she has spent some of her happiest years in the Company's service.

LVI.—ETHEL AITKEN EPPS.

THE Clerk-in-Charge of Bromley was educated at Roans School for Girls, Greenwich, and entered the Company's service at the Hop Exchange, on Nov. 8, 1895, direct from school. Miss Epps' service commenced in those early days when operators' accommodation did not receive the thought and attention of to-day, and she is thus able to appreciate the improvement in this repect, and is not a little proud of the new exchange of which she has charge, and which was on Aug. 14, removed from a very old building to very fine new premises, and transferred to the central battery system.

Throughout her telephone career Miss Epps has given uniformly good service. In March, 1903, she was appointed as Supervisor at the Metropolitan Operating School, where she performed her duties with singular success in a position where peculiar qualities, apart from the essential detailed knowledge of the work, are needed in the training of the young telephonists. In July, 1905, she was

ETHEL AITKEN EPPS.

made Senior Supervisor-in-Charge at Bromley, and in October last was classed as a Clerk-in-Charge.

It can safely be said that although Miss Epps is very firm and decided, and very keen for the reputation of her exchange, Bromley is not ruled with a rod of iron, her manner being persuasive, helpful and always sympathetic.

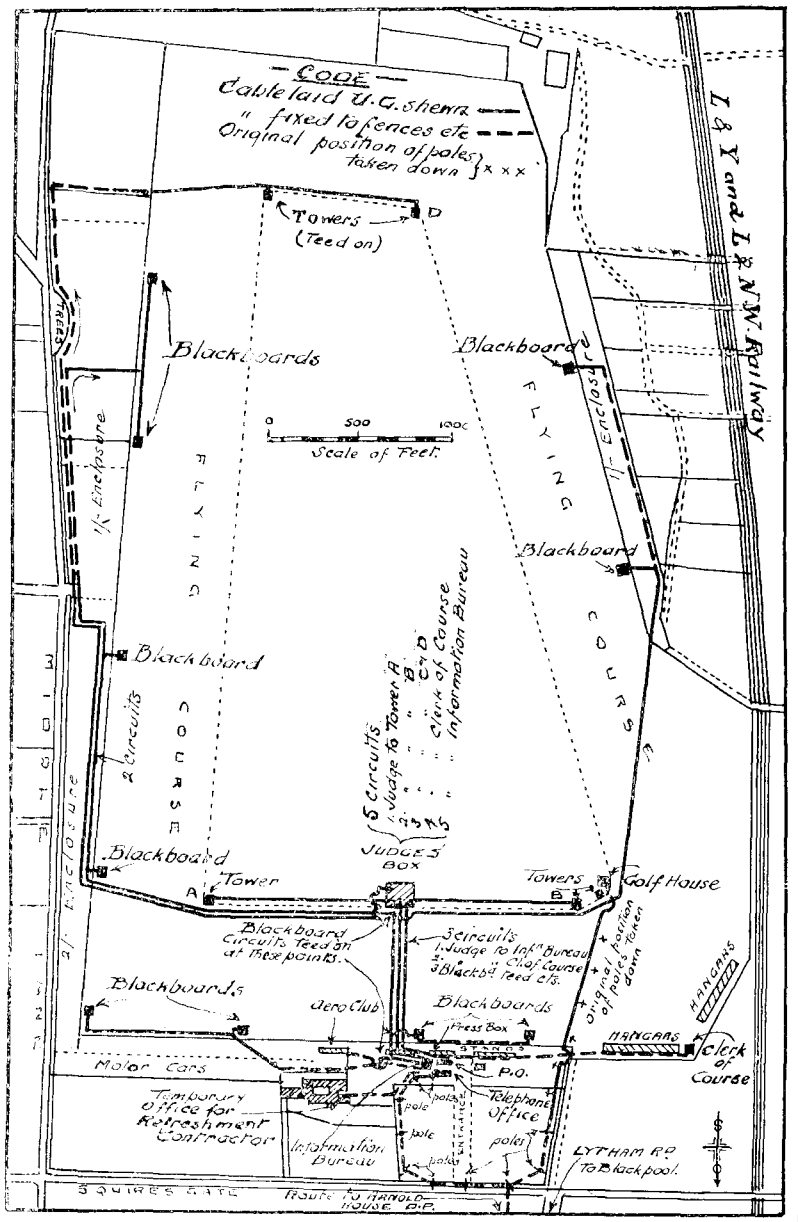
Miss Epps states that her favourite pastimes are walking and reading, her favourite books being among those of standard authors.

AVIATION WEEK AT BLACKPOOL AND THE TELEPHONE.

BY H. GOODMAN, *Assistant Engineer, Blackpool.*

IN most big enterprises whether commercial or otherwise the National Telephone Company usually has "a finger in the pie," and so in the case of flying week at Blackpool it came in for a good share of the work.

An observant man must have been amazed at the arrangement of such a colossal undertaking at such short notice for so brief a period. Huge stands were erected for spectators; hangars or aeroplane sheds were fitted up; a barricade 8 feet high was erected



all round the ground several miles in circumference, and a 4-feet barricade on the inside of the ground around the flying course. Pylones or towers about 40-feet high were built to mark the turning points, bunkers were levelled (as the course was over part of the golf links), hedges taken down, watercourses etc. filled up, gas and water mains laid, telephone, post office and electric light cables and wires erected. Altogether it was an undertaking which might have made an even larger town than Blackpool seriously ponder before taking it in hand.

So far as the National Telephone Company was concerned in the matter very little notice was given of the requirements, and consequently very little time was available to finish the necessary work in time for the opening.

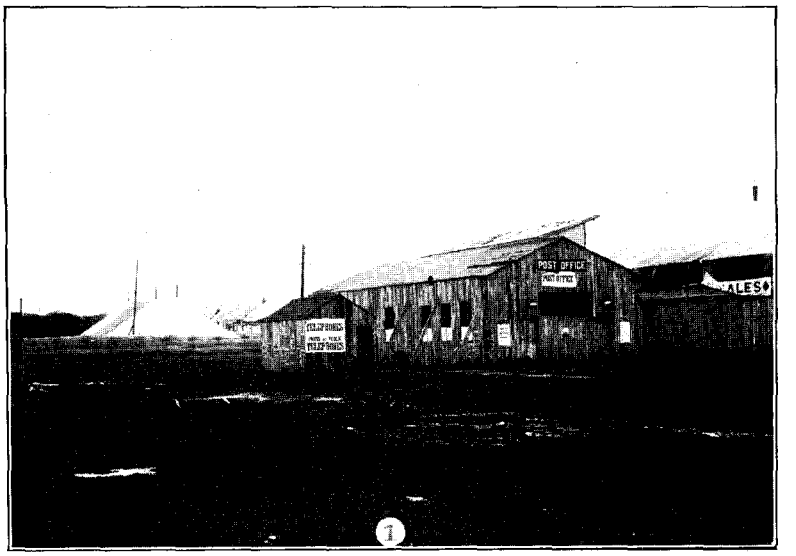


FIG. 1.—View of Telephone and Post Office taken from Main Entrance.

The bulk of the work on the aviation ground itself was carried out with vulcanised indiarubber cable, but as there was not enough of this in the local stock, the deficiency was speedily obtained from other centres.

FIG. 2.—View of Tower "B" (foremost) and another Tower near to Golf House. Telephone only in Tower in foreground. Door of Hut shown open.

From the Blackpool Exchange to the distributing pole nearest to the ground 41·6 miles of underground wire was brought into use, and from this point onward to the ground 21·75 miles of open wire was erected, and the necessary additional arms fitted to the poles.

Six poles out of a route of eight which were erected across the field from Squires Gate to the golf house, carrying the golf club's own circuit, had to be taken down and 560 yards of one-pair vulcanised indiarubber cable laid in lieu thereof. As eight exchange circuits were required to the telephone office, five of these poles

were utilised to carry them, and after the expiration of the flying period these poles were taken down and re-erected in their original position, and the one-pair vulcanised indiarubber recovered.

The accompanying plan shows how the one-pair cable was laid and fixed.

Round the course the committee had erected ten blackboards

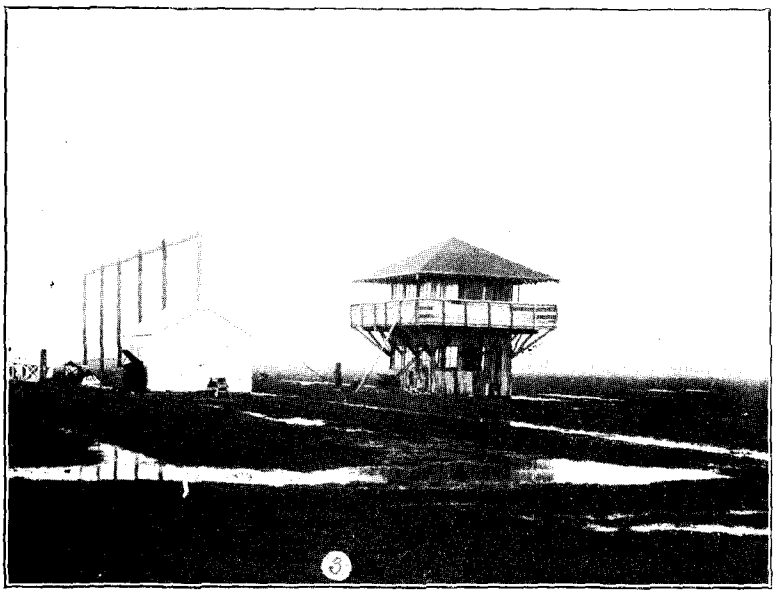


FIG. 3.—View of Judges' Box and Signal Posts. Signals on the ground. Hangars in distance.

to afford information to the spectators. Alongside these blackboards were huts—ordinary watchman's huts—and in each was fitted a telephone set. The circuit connecting these huts was joined up in parallel, thus enabling the information bureau to supply quickly and easily the news to the blackboard attendants.

As no time had to be lost in doing the work, every available position was utilised in fixing the cable so as to get through the

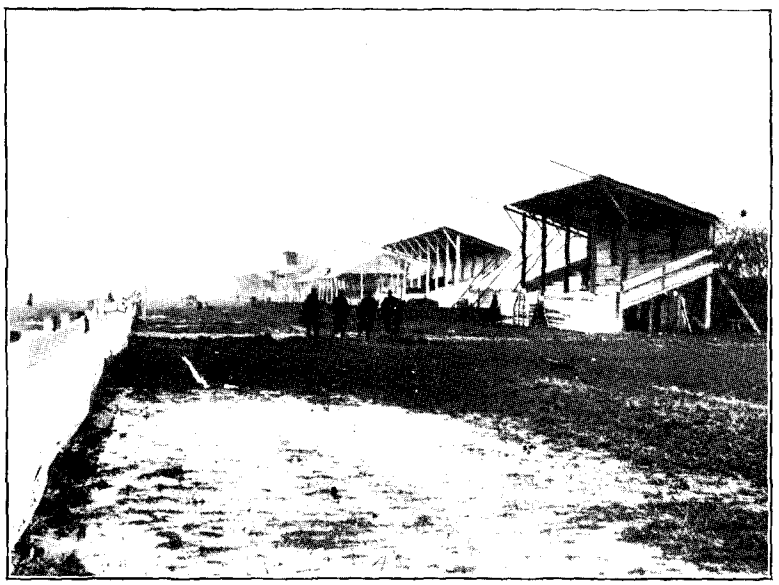


FIG. 4.—View of Grand Stands (looking west) in course of demolition. Aero Clubs' Private Stand second on the right, and the high stand in middle distance is the Press Box. Hangars in distance to left.

work as speedily and economically as possible, without lessening its efficiency and, at the same time, so as to minimise any danger of damage to the cable.

When the cable could not be openly supported it was laid in the ground and all the joints were very carefully made with rubber, adhesive and ozokerit tape sweated on. Each joint was tested as it was made and on the final test of all the circuits everything was "O.K."

With regard to the instruments and apparatus necessary in connection with this work the following statement gives their number and position:—

Position.	Instruments.
Judges' Box	6
Towers	8
Blackboards	20
Telephone office	18
Information bureau	6
Clerk of course	2
Steward	2
Refreshment contractor	2
Press box	2
Total	66

Everything was very satisfactory, and had the weather maintained the same brilliancy to the end of the week as the beginning promised, "aviation week" at Blackpool would not only have been distinguished as the first official "flying meeting" in England, but would have gone to posterity as a conspicuously successful one.

LONG SERVICE MEN.

AN interesting ceremony took place at Head Office on Monday, Dec. 6, the occasion being the presentation of a gold watchguard and a purse of money, subscribed for by members of the Head Office staff, to Mr. C. Burke, of the Stores Department (Head Office), who has been nearly 30 years in the service, on his transfer to the Southern Division, Metropolitan centre.

MR. C. BURKE.

Representatives of the various departments were present. Mr. Fletcher, of the Engineer-in-Chief's Office, who made the presentation, in referring to the request that he should do so, pointed out that Mr. Burke and himself were two of the oldest members of the Company's staff, his own term of service having exceeded 31 years, and Mr. Burke's being nearly 30 years. Mr. Fletcher's remarks were of a highly complimentary character as to his personal experience and knowledge of Mr. Burke during that long period. He considered that the form of the present was very appropriate, and hoped that each link of the chain would be a reminder of some pleasant associations with his fellow-workers, and trusted that he would be spared for many years to wear it.

Mr. CRISPIN SPIERS, Assistant Engineer, has completed 25 years' telephone service in Birmingham. He entered the Company's service in October, 1884. At that time there were about 70 subscribers in Birmingham on the single wire or earth circuit system; now there are over 14,000, and Mr. Spiers is in the unique position of being able to say that he has been in touch with every line that has been run in the Birmingham district, and has taken part in every change that has been effected for the improvement of the service up to the present day. It was the spontaneous desire of the Birmingham staff not to let the occasion go by without making a suitable acknowledgment of his length of service, and also of the esteem in which he is held by all. This took the form of an illuminated address (specially designed and completed by a member of the staff, Mr. Wood) and a marble clock and bronzes. To make the occasion memorable, a Bohemian concert was arranged at the Imperial Hotel, on Friday, Nov. 19, when the presentation was made by Mr. Coleman, the Provincial Superintendent, under whom Mr. Spiers has worked during almost the whole of the period in question. Mr. Coleman expressed the pleasure he felt at being asked to carry out that duty, and in a speech reminiscent of the early days of the telephone in Birmingham, when he was more closely associated with Mr. Spiers in the practical work of construction than at present, he voiced the sentiments of the staff in complimenting Mr. Spiers in his splendid service with the Company and extended to him best wishes for the future.

MR. CRISPIN SPIERS.

The National Telephone Journal.

"BY THE STAFF FOR THE STAFF."

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INCENTIVES TO ACHIEVEMENTS.

AN interesting controversy is raging in the *Electrical Review* primarily arising from an article entitled "The Fetish of the Steady Job," the writer of which begins by stating that "there has of late years been a wild and undignified rush for the permanent position, and its effect is being felt in every trade and profession;" and goes on to say: "The modern tendency is to avoid hardship, risk and worry at all costs, and the only means of accomplishing this, as it seems to the immature mind, is to obtain some berth where the possibilities of dismissal are rare since the responsibilities are *nil*, and where there is a prospect of an uninterruptedly quiet life with a pension in the future." From this tendency he draws a dismal picture of the decadence of nations whose sons aspire to Government positions, and postulates that the wonderful advance of the United States in every direction is in reality due to nothing less than the uncertainty of tenure of position—to the metaphorical sword of Damocles which hangs over the head of every man who knows that any day may find him deprived of his means of livelihood. He foresees with some equanimity that in an ideal state of healthy competition many would fall and be trampled on, "but the ideal man would rise to greater heights untramelled by the retarding influence of those with no incentive"; he thinks that under present English conditions the weak keep back the strong, that the Government and county and municipal authorities are especial offenders and concludes with the inspiring sentence: "Let no man be certain of his position, let him fight every day of his life for what he has, and the nation's progress will be as rapid as if it were composed entirely of those whom we now call great."

There is certainly something in this doctrine suggestive of a crossbred offspring of Nietzschean philosophy and American hustle, and one is not surprised to find allusions to supermen flying about in the controversy. One correspondent writes: "When a man has reached middle age, has a wife and the privilege of moulding and forming the minds of his children, it is not right, or even necessary, he should dash about with hair-brained schemes for worsting his business rival. What your contributor calls the survival of the fittest means the survival of the unscrupulous," deprecating the turning of a country into "a bear garden of conflicting small-souled business fiends each with a great idea of his own powers and determination to worst everyone who comes in his way."

Further, he says very truly: "Again, supermen are not produced by industrial competition, and they never have been, but by intellectual competition, and the two are as far apart as the poles. As I have said, when a man has reached middle age it is his time to enjoy, as far as he can, what is left of his life. What is the earth for? To turn into a great murky industrial battlefield, with ineffaceable signs all around of the crushed out and the mained to nauseate and embitter those on top? Or is it not rather for the use and enjoyment of all its inhabitants? . . . I can name a host of the world's greatest engineers, artists and inventors who have died poor, whose genius was, in some cases, only recognised after their death, who would undoubtedly have been crushed out in the struggle your contributor eulogises—men whose names and works will live long after the last sweater-hustler's name has ceased to be remembered."

There seems to be in the whole discussion a confusion of two widely dissimilar issues. We have never disguised our opinion that well-directed private enterprise is more efficacious in developing an invention of public utility than the slower moving methods of State administration. In our own especial field the facts are almost too well known to rehearse again. In America, on the one hand, the telephone service is rapidly being developed to its utmost limits; in Europe on the other hand, State-controlled, the telephone system is either, at best, moderately developed, or else absolutely starved. There is no doubt that in a well organised company the freer stimulus given to individual merit and capacity, and the reaction of the latter both on the quality and earning power of a service, benefits a far wider circle than the shareholders—namely, the public at large. The fact that rewards and promotion are not automatic as they are under Government, also makes for efficiency. To this extent, therefore, a part—but a small part only—of the case of the first writer is made out.

The question whether it is of greater benefit to a nation for its people to seek an honourable competence or to engage for their own aggrandisement in the ruthless destruction of their fellows, scarcely admits of two opinions. In the first place, it seems superfluous to point out that almost everything great in the fields of science, art or literature has been achieved for its own sake, the pecuniary reward being quite a secondary consideration; and, in the second place, that the amassing of huge personal fortunes as the outcome of a too-religious adherence to the gospel of hustle, whilst of advantage to the individual, is of less than dubious benefit to the State. We do not, of course, lose sight of the fact that in working a patent or extending the usefulness of an invention the commercial element enters in and gives full play to the exercise of "push," "hustle" or whatever slang term may be chosen to designate the honourable qualities of business capacity and efficiency. These qualities are appreciated by business corporations, and, rightly enough, will get a man on in the world. The

slack, listless and unenterprising must very properly expect to stand still.

But in none of these considerations is there any argument against the desire of a man to obtain a steady job. Whilst many natures are incapable of their best efforts under the pressure of an unequal conflict with the world, others although capable of fighting the battle are nevertheless handicapped, and can better apply their energies to important and beneficial work when relieved from the necessity of struggling against their neighbours. Lastly, as another contributor to the controversy points out, there is always the large army of hewers of wood and drawers of water. Even the most pushful and energetic communities consist of a huge majority of average men by whom the vast mass of necessary routine work is usefully undertaken; these cannot be neglected in any practical economic scheme.

The National Telephone Company and the great American Bell Company possess well-equipped Investigation Departments, in which incidentally the interests of science as well as of the telephone service are considered. The members of these departments, who must necessarily be competent in order to enter them, may be considered to have "steady jobs." Does anyone suppose that they are lacking in stimulus, or prosecute their scientific enquiries with less vigour because they have no momentary fear of being turned into the street? Does the distinguished professor of science or literature diminish his good work when he is provided with an honourable sinecure? Of course he does not. And therefore we think that to endeavour to trace any correspondence between "steady jobs" and national decadence is worse than futile.

THE EVER-INCREASING DIRECTORY.

THE publication on the 1st of this month of the new issue of the telephone directories with their enormous bulk of 3,056 double-column pages, including upwards of 588,000 names, gives rise to some speculation on the past, present and future of these ever-increasing volumes. In the early days of the telephone a small card sufficed to contain the full list of the subscribers in London, and this list had increased in 1896 to a book of 173 pages. Up to that year the name on the exchange was not prefixed to the subscriber's numbers, which ran from No. 1, London, upwards It is interesting to note that in 1896 two of the original numbers of the year 1879 remained unchanged—viz., No. 1, Harvey Brand & Co., and No. 4, Quilter Balfour & Co. In the directory for 1896-7 the London portion had increased to 183 pages of much larger size and the names of the exchanges first appeared before the numbers. The numbers, however, were not altered to any great extent, what had been 65111 London becoming 65111 Holborn, and 11376 London, 11376 Avenue. In this year the directory for the whole country was first published in one volume and contained 1,350 pages. In 1900 it became necessary to make use of double columns, but in spite of this expedient the book contained 1,360 pages, or only a few hundred less than in the issue of 1899 in single columns. The unwieldiness of the directory had, however, now increased to such an extent that it became impossible to include the whole country in one volume, and in 1901 the book was published in volumes corresponding to the provinces into which the country is divided for telephone purposes. These in their turn became unwieldy, and a few years ago it was decided to issue the directory in 55 sections corresponding to the Company's Districts.

As the number of subscribers increases from year to year, it is self-evident that the bulk and cost of producing the directory increases proportionately; but the increased cost does not cease here, for the book becomes not only larger and more expensive, but it has to be supplied to a greater number of subscribers. When we consider that the five or six hundred thousand subscribers in the country will in the natural course of things have risen to a million in a few years time and in a decade possibly to two or three millions it will be seen that the issue and distribution of the directory will have become a colossal undertaking. When we further consider how few of the myriad names and numbers in the directory the average subscriber ever consults, it may ultimately be necessary to reconsider the whole question of the economic justification for issuing the directory at all. It is reasonable to assume that within comparatively few years the number of telephones in London will reach half a million; and of this huge number few subscribers will, in the ordinary course, require to speak regularly to more than 50. Whether the solution of the problem may not be found in the establishment of an enquiry department at each exchange to which the subscriber may be switched through whenever he wishes to communicate with anyone outside his usual circle of correspondents is a question which will doubtless have to be faced at some future day when the control of the service has passed from the Company's hands.

THE FIRST EUROPEAN TELEPHONE EXCHANGE.

IF any proof were required of the difficulties besetting the path of the historian and the uncertainty of evidence regarding unobtrusive events which the light of later knowledge subsequently proves to have been of prime importance, it would surely be furnished by the correspondence in the *Electrical Review* as to the date of the opening of the first telephone exchange in Europe only 30 years ago. It may be remembered that HUXLEY, in his essay *On the Value of Witness as to the Miraculous*, records the strange fact that as regards an event of such widely recognised significance as the execution of King CHARLES I, it could not be ascertained with certainty on which side of Whitehall he was beheaded. Seeing that this event was witnessed by a great crowd and created a profound impression at a period when the printing press was well established and prolific, HUXLEY points out that if, in this case, evidence is conflicting, much more unreliable is the witness as to the details of mediæval and ancient history. Still stranger is it that there should be any difficulty in determining accurately an event which occurred in an age when everything of importance is instantly recorded in hundreds of newspapers. The first exchanges, however, unlike the earliest railways, were not opened with the accompaniment of flags, brass bands, banquets and speeches, although as soon as the importance of the telephone began to be appreciated the installation of new exchanges in large towns was sometimes signalized by public ceremonies. The part which the

supposed "scientific toy" was to play in civilisation was not appreciated in the year 1879.

Another difficulty which confronts the investigator is that in some cases at least there was probably no formal opening of the first exchange At some period between the time when work was first commenced on the switchboard and the time when a fair number of subscribers enjoyed telephonic intercommunication, there would be a stage when half a dozen subscribers were receiving *bona fide* exchange service. Hence the first of these dates would be too early and the second too late to be fixed as the actual date of opening. We have been at some pains to collect evidence on the subject, and what is indisputably established appears to be that in September, 1879, exchanges were working in Coleman Street and Lombard Street, London, and in Faulkner Street, Manchester, with not more than about 30 subscribers between them, and that exchanges in Liverpool, Wolverhampton and Sheffield followed in quick succession. Mr. J. G. LORRAIN is of opinion that he had the Manchester Exchange working in the July of the year mentioned, whilst Mr. POOLE would put it at some date in September; Messrs. FLETCHER and C. J. PHILLIPS can testify that the Coleman Street Exchange was working in August, 1879; and Mr. J. E. KINGSBURY produces evidence that the Lombard Street Exchange was publicly opened in September, but has no doubt that service was given for some time previously. Further, a correspondent in the *Electrical Review* of Dec. 17 states that the latter exchange was established in September, 1878, and gives a photograph of its switchboard and a list of its six subscribers. This, however, does not appear to be a switchboard in any recognised sense of the term. It is only an electric bell indicator board by means of which it would not be possible to put subscribers in communication with one another. We are therefore not much nearer the solution of the question; personal evidence is conflicting, and all that documentary evidence has established so far is that there is very little to choose between the claims of the three exchanges in London and Manchester to priority.

AUTOMATIC EXCHANGE EQUIPMENT.

IN another column there appears an extract from a paper read by Mr. J. HYDE before the Sheffield Telephone Society describing an automatic exchange equipment, and, in particular, some of the recent improvements in this apparatus.

For a number of years it has been well known that the automatic apparatus would operate with a high degree of satisfaction; that is to say, that there was no necessity to look upon the apparatus as unreliable. The two main questions regarding the adoption of this equipment have really been: (*a*) Does its use permit a telephone authority to give the service which is requisite to meet the public demand? and (*b*) What is its cost?

The above remarks refer to what is known as the full automatic system, which is the one described in the article.

In our next issue we hope to give a description of a semi-automatic equipment which has recently been established in the United States, and which contains a feature which we believe to be more sound—namely, the retention of the skilled intelligence of the operator, assisted by a larger amount of automatic machinery than she already has at her disposal.

HIC ET UBIQUE.

OUR Brighton correspondent sends us a copy of a letter received from a wayleave grantor in Eastbourne on whose property the Company has a 60-feet distributing pole. An offer on the part of a wayleave grantor to pay the Company half the cost of removal (more especially as in this case the prime cost is about £60, of which the grantor is fully conversant) is probably a unique example of considerate treatment.

Dear Sir,—I am sorry if at any time I have appeared brusque in manner or unreasonable in request for removal of telephone pole. Feeling it is best for all and for all things that the contract end this year, were it possible I would be pleased to contribute one-half the cost of this early removal. As it is, I will gladly with the Company's approval, defray the rental of pole (as previously paid to me) for period of three to five years. Assuring you of my thanks for all courtesies shown by yourself and others.—I remain, etc.

LIEUTENANT A. H. SCOTT, R.E., writing on "Searchlights, Other Means of Illumination, and Telephones at Port Arthur," in the *Royal Engineers' Journal* of December, 1909, certainly describes a good example of "how not to do it" as regards the use of telephones in war.

The telephone lines at Port Arthur belonged partly to the artillery and partly to the engineers. Owing to the lack of *personnel* only some of the lines could be used.

The construction was very bad, and men were often seen running from one telephone station to another with a message. A battery had often to ring up several exchanges to get into communication with one of its "observation instrument" cells, and as one line was often used for several batteries each had to wait its turn, perhaps for 30 or 35 minutes.

All the lines were carried as air lines, and were often cut by shells or inimical Chinese. There were no special "command lines."

NATIONAL TELEPHONE PROGRESS.

DURING November 2,853 new stations were added to the Company's system, making a total of 500,007. Exchanges have recently been opened at Aylestone (Leicester) and in Liverpool ("Bank"), making 1,564 now working.

LIVERPOOL DISTRICT.—*Bank Exchange.*—On Dec. 12 a new central battery exchange, called Bank, installed in a specially designed building, was brought into use. The equipment is of the No. 1 type and gives accommodation for 2,500 subscribers' lines; 1,368 subscribers' lines, previously working on Royal and Central Exchanges, were transferred to Bank Exchange for the opening.

Wavertree.—The installation, in a specially designed building of No. 1 central battery equipment for 1,440 lines is now in hand.

GLASGOW DISTRICT.—*Hillhead Extension.*—The installation of an extension by 580 lines to the present No. 1 central battery equipment is now in hand.

BIRMINGHAM DISTRICT.—*Edgbaston Exchange.*—The installation, in a specially designed building, of No. 1 central battery equipment for 1,000 lines is now in hand.

ADVANTAGES AND DISADVANTAGES OF THE CENTRAL BATTERY SYSTEM.

THE following is an answer to the second part of a question in a recent issue of an electrical paper as to the advantages and disadvantages of the central battery system:—

(*a*) Advantage (*c*) really turns itself to a disadvantage in the case of a lazy operator. A noiseless lamp does not attract the attention of the operator as does a noisy shutter, thus causing a loss of time in getting into connection. (*b*) This disadvantage is due really to the ignorance of the subscriber. Should he fail to attract the notice of the operator, he waggles his receiver hook up and down as fast as possible. This does no good; it does not keep putting his lamp out, and then relighting it, owing to the time lag in the filament and circuit. This state of affairs is only obtained when he moves his receiver hook up and down by a slow motion. On the other hand, the magneto system gives him an advantage. The more vigorously he turns his magneto handle, the more noise does the shutter at the operating table make, and the quicker does the operator strive to get him into circuit.—S. G. W.

It is to be hoped that the writer of the answer is not a member of the National Telephone staff.

POLICE ! ! !

LEEDS district has, after three years' canvassing, obtained 47 orders on the measured rate, and has others in prospect, for connecting the West Riding Constabulary Police Stations. Papers please copy.

AUTOMATIC EXCHANGE EQUIPMENT.*

BY J. HYDE, *Sheffield.*

ANYONE interested in telephonic progress cannot but be struck with the rapid developments which have taken place within recent years. During the past nine years this branch of electrical engineering has been divided into two distinct systems: (1) Manual exchange working—that is, where the subscribers' connections are made by means of one or more operators; (2) automatic exchange working, in which the subscriber makes the necessary connections.

The disadvantages of the automatic system, such as, for instance, inadaptability to common battery working, have now been eliminated, common battery automatic exchanges having now been in successful operation for at least two and a half years.

My paper shall be divided into three parts:

(1) The operating of a manual common battery exchange.

(2) The operating of an automatic common battery exchange.

(3) A telephone system.

(All are more or less familiar with part 1 of my paper—that is, the operating of a manual common battery exchange. I shall therefore in this extract pass on to section 2.)

Figs. 1 and 2 show respectively the subscriber's wall and table instruments used in connection with the automatic system. The method of calling is as follows:—The subscriber takes off his receiver, puts his finger into the holes corresponding with the figures required in their relative order. He then moves the dial round by this means until his finger comes into contact with the stop at the bottom, and then lets it go back of its own accord.

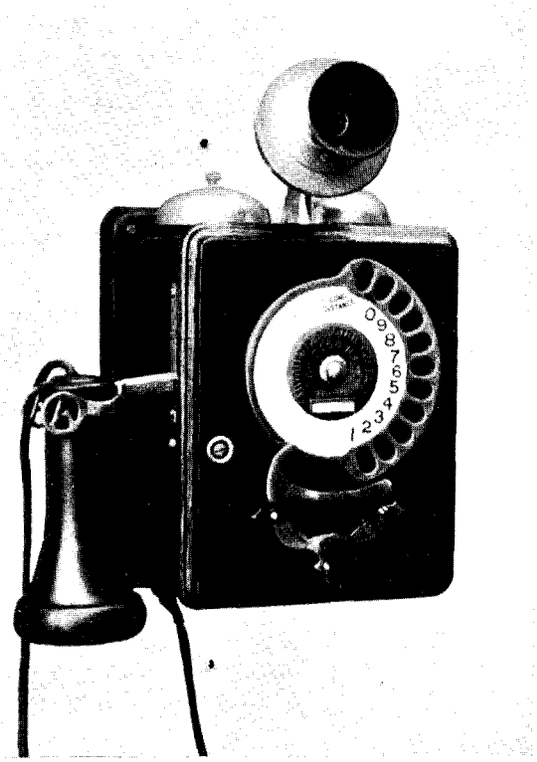


FIG. 1.

After making the connection the subscriber presses the ringing key, which can be seen on both instruments underneath the finger stop, by this means actuating a relay which effects particular ringing required on the called subscriber's line. Should the subscriber be engaged the calling subscriber will receive the engaged tone test in his receiver when he tries to ring.

* Extract from paper read before the Sheffield Telephone Society.

We may now observe what actual action takes place in the exchange. To build up the series of connections we will start first with a 100-line equipment.

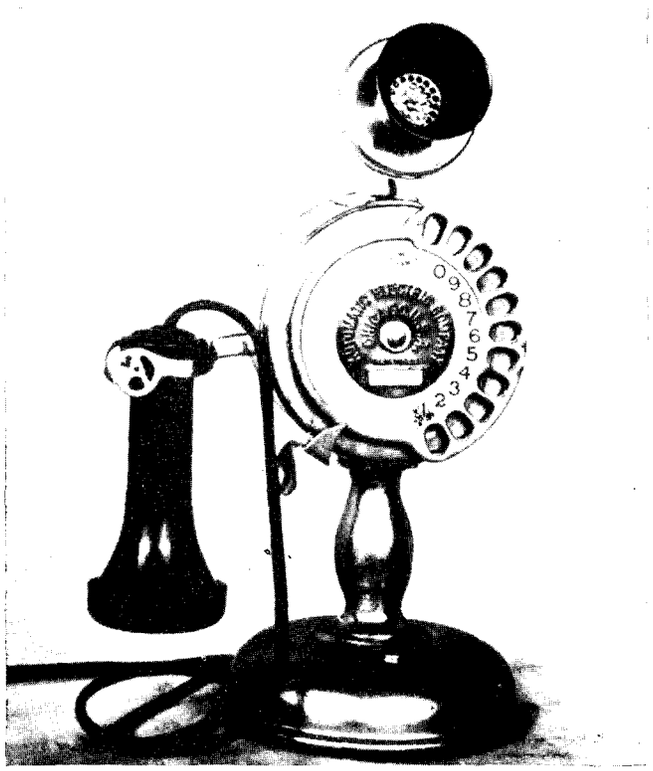


FIG. 2.

Fig. 3 is a perspective view of a connector on which terminate 100 lines or circuits for subscribers.

The subscribers' lines are arranged in rows of ten, so that we have ten rows of ten subscribers each to complete 100 lines. Now suppose a subscriber requires 27, he will, as before mentioned, lift off his receiver, put his finger in hole 2 and bring the dial round to the stop, then release the dial. In going back the dial earths one line twice and always finishes up any figure by earthing the other line once. The first line is known as the vertical line the other as the rotary line.

The two earth movements on the vertical line cause a relay to lift the connecting apparatus to the second row, the earth on the rotary line operating a compound switching key, which has three positions, to the second position, it being normally in the first position when disengaged.

The subscriber now puts his finger into hole 7, bringing round the dial as before; this on being released earths the vertical line seven times, but the effect of the compound switching key moving to the second position causes the seven movements to be rotary now instead of vertical, the earth on the rotary line putting the compound switching key into the third position, which is the speaking position. The subscriber now depresses his ringing key and is thus able to ring the subscriber required.

After speaking the calling subscriber automatically disconnects the line by hanging up his receiver, causing both lines to be earthed together.

Fig. 4 is a diagram of the connector connections. V.L. and R.L. are respectively the vertical and rotary lines from subscriber's instrument. The side switch is the compound switching key, V.R. is the vertical relay which actuates V. (vertical magnet) every time the V.L. is earthed, when the side switch is in the first position, by this means raising the wipers to the required bank of lines. Should the side switch be in the second position, V.R. will actuate R., the rotary magnet, causing the wipers to rotate to the required line.

R.R. is the rotary relay which is actuated by the earth on the R.L. at the end of each figure. It actuates P.M. (private magnet) which changes position of side switch.

When P.A. (private magnet armature) is attracted by P.M. (private magnet) P. slips past the top of one of the lower teeth, but is held by the top teeth on E.S. The side switch, therefore, does not move from one position to the next until P.A. (private magnet armature) is released.

When a subscriber is engaged his contact on private bank is earthed. If, therefore, another subscriber wants him the R.R. in actuating P.M. allows S6 and S7 to come into contact, owing to the subscriber being engaged this completes Rel. M. (release magnet circuit), which, when attracted, pulls the dogs clear of the vertical and rotary teeth, causing the wipers and side switch to go back to the normal position. The subscriber when he now tries to ring earths the V.L. raising the wipers and so completing the engaged tone circuit at O.N.

G.R. is the generator relay, which is actuated by V.R. when the side switch is in the third position.

When the system was first brought out each subscriber had one of these connectors; that would correspond to having a pair of cords for every subscriber's lines on a magneto board. We know that this is not necessary on a manual board, only a certain percentage of cords being required.

Observing on the automatic system that a large percentage of these connectors must be idle throughout the day, means were adopted to devise an apparatus by which a percentage number of

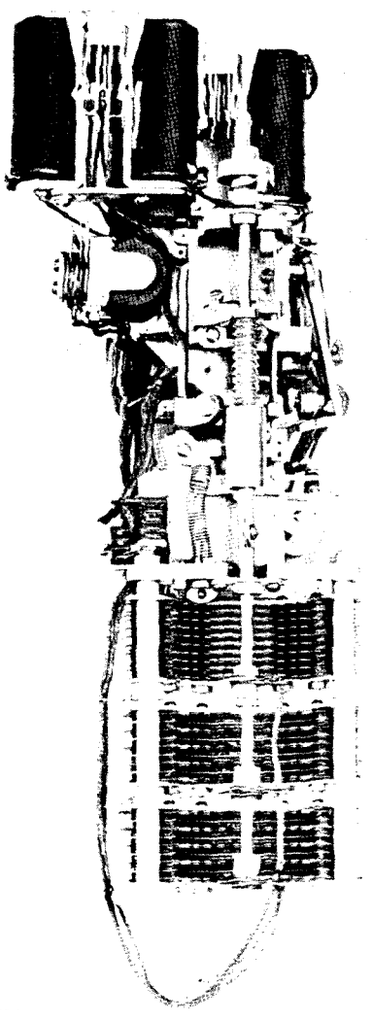


FIG. 3.

connectors might be used for 100 subscribers. These connectors can be looked upon as corresponding to the pairs of cords on a manual board.

This led to the development of an apparatus known as the Keith line switch unit. In this apparatus we have 100 lines grouped together with ten connectors to be used for making the connections. This 10 per cent. trunking is usually found to be sufficient on an automatic board, but the percentage of trunking lines can be increased. Each line terminates on what is known as a line switch, which has in front of it a multiple of ten circuits

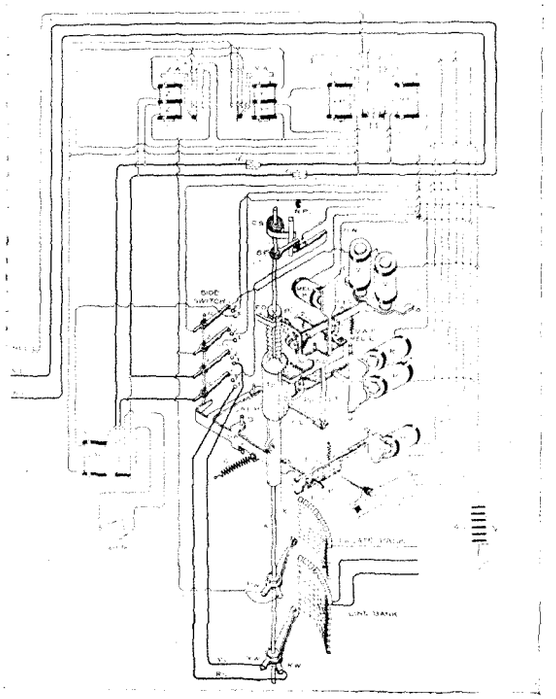


FIG. 4.

these terminating on cross-connecting tags, a similar set of cross-connecting tags being wired to the connectors. These sets of tags are strapped across by means of cross-connecting wires. When a subscriber calls up he automatically connects himself to a disengaged

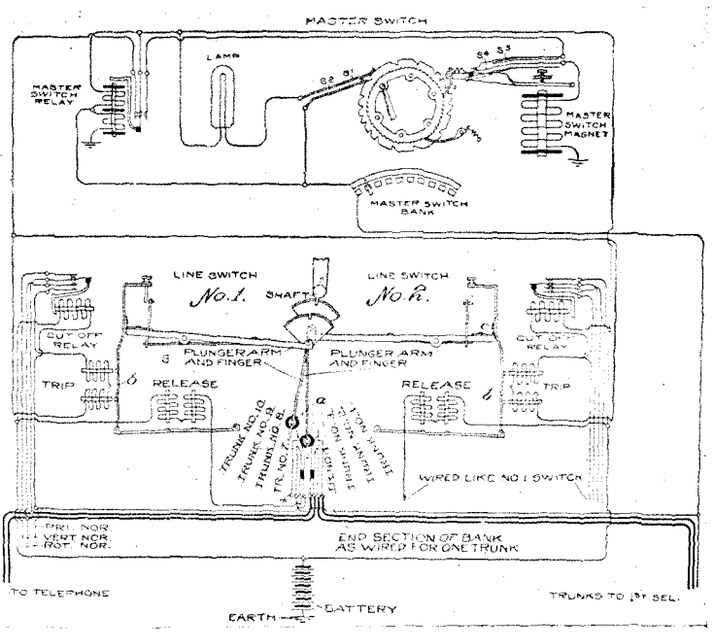


FIG. 5.

connector by means of his multiple and makes his connection in the usual way.

Fig. 5 is a diagram of the line switches and master switch. The master switch is used for changing the position of plunger fingers, each subscriber having one of these plungers allotted to him.

A subscriber when making a call pulls up the armature of the trip relay. This releases the plunger arm, the spring of which forces forward the plunger finger as shown in line switch 1. This

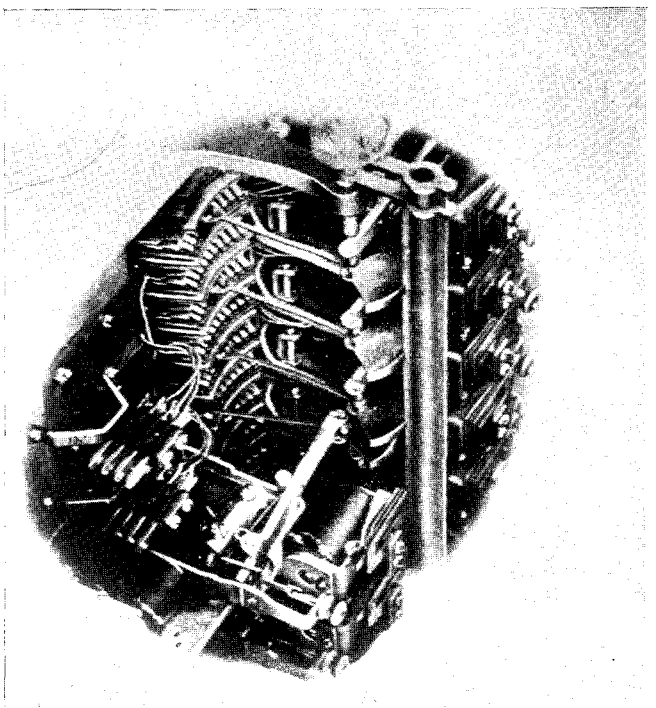


FIG. 6.

junction line, now engaged, completes a circuit through the master switch bank, operating the master switch relay, which is a differentially wound relay. This completes the master switch

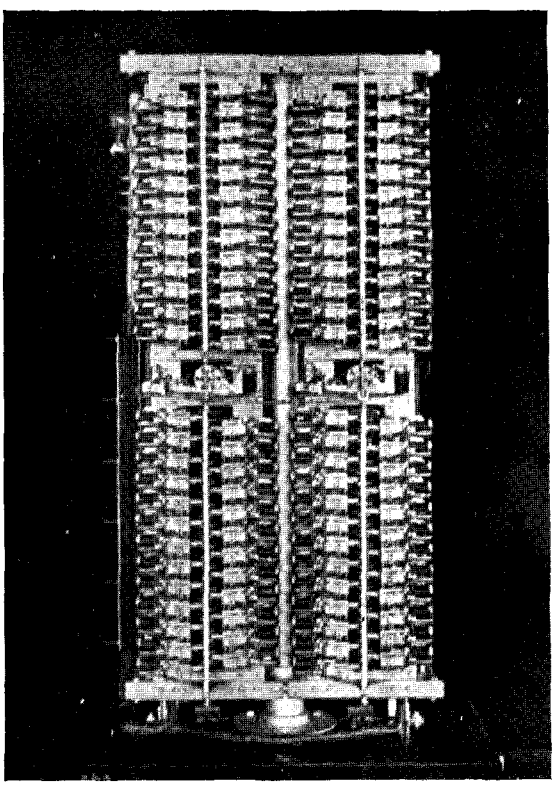


FIG. 7.

magnet circuit, which works on the principle of the trembling bell, causing the master switch to rotate. This movement completes the master switch relay by means of another circuit through lamp S1 and S2, so that the circuit remains complete after the wiper arm has passed from the bank contact. The master switch in rotating carries forward by means of a vertical shaft all the disengaged subscribers' plungers to the next disengaged junction.

When the subscriber has finished speaking, by hanging up his receiver the release relay armature is attracted. This armature engages with the end of the plunger arm and so allows the plunger finger to be withdrawn from the springs, and is now as shown in line switch 2.

Fig. 6 is a perspective view of a line switch unit's detail, and shows one line occupied. The vertical shaft can also be seen which carries the plunger arms forward from an engaged junction to a disengaged one.

Fig. 7 shows a line switch unit on which terminates 100 subscribers' lines. These are arranged in four vertical rows, thus the left vertical row has subscribers 01 to 25, the second row subscribers 26 to 50, the third row subscribers 51 to 75 and the last row subscribers 76 to 100.

The ten connectors for these are fitted on the other side.

At the left-hand side may be seen the tags for terminating cables.

(To be concluded.)

CORRESPONDENCE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I SEE your JOURNAL every month, and have derived a considerable amount of useful information, and also amusement at times from its contents. In the December issue, however, I notice a photograph and short paragraph which appears to require some amplification. It is entitled "Dignity and Impudence" with a note "Our Cheltenham correspondent sends us the above photograph. The tired-looking pole, it may be observed, does not belong to the Company." This, I think you will admit, gives a rather false impression On reading this one would suppose the tired-looking pole belonged to the Post Office, as the Company and the Post Office are the authorities principally concerned in this class of work, and no doubt this is the impression made on the minds of many of your readers. This is an entirely wrong impression. The photograph is taken at the top of Cleeve Hill, one of the highest points in the Cotswold Hills, and the pole which is inferentially styled "Dignity" is the property of the Post Office, not the "tired-looking" pole as might be supposed from the letterpress.

I think you will agree that this amplification is necessary to correct the wrong impression which has undoubtedly been made in the minds of some of your readers, and I shall be glad if you will favour me by publishing this correction. I enclose my card.

Dec. 7, 1909. "P.O. ENGINEER."

[The photograph and note were published as received. We do not think that anyone acquainted with the Department's work would mistake the "tired-looking" pole for a Post Office pole; moreover, our readers are well aware that private telephone lines exist in various parts of the country. We gladly, however, take the opportunity of saying that the larger of the two poles is a Post Office pole and the smaller one is privately owned.—ED., "N. T. J."]

Re BOOKS B95 AND B96.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I OBSERVE that the numbering of these books has been altered to make each book 1 to 100, and I would suggest a reversion to numbering in continuous sequence.

The latter was a much more convenient method for the districts to trace slips and also for filing.

Of course Head Office may have made the alteration to save expense, but I think the money would be saved at the district end by filing and tracing If there is any other objection to a long sequence it could easily be obviated by running first, 1 to 99,999 or 999,999 and then using the letters of the alphabet "A" to "Z" in front of the numbering.

Nottingham, Dec. 16. "G. H. C."

"CONTROL."

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

PERMIT me in a word to express my appreciation of the excellent article by Mr. Hare, which appeared in the last two issues of the JOURNAL. Some of its readers would, no doubt, differ as to details, but with the sound logic with which it is permeated, and the lucid manner in which it is set forth, there can be no manner of discord.

A glimpse of the obverse side of this subject, namely, as it appeals to the controlled, may not, at this juncture, be entirely out of place.

Men reach positions of authority by devious routes, but in this company, at least, the most common of these, I venture to submit, is that which combine industry with an unswerving devotion to the interest of the firm, and unlike Malvolio by virtue of Malvolio yellow stockings.

Mr. Hare advocates in one part of his paper the concentration of one's energies in one particular branch of the Company's work. Consider, however, the effect of this method if applied by those in the electrical department. It is essential to complete the curriculum of an improver in this department that his faculties of administration should be cultivated.

This opportunity however, is rarely given, and we are in possession of men who are either competent electrically and unfit to control a staff, or *vice versa* in any case combinations of both are as a rule a negative quantity. My first point therefore is that *absolute* concentration of thought on any one branch of telephone work may be derogatory to the welfare of the individual and no less to the Company as a whole.

Further on Mr. Hare illustrates the value of "control with reason." His picturesque comparison of the locomotive and motor car is very much to the point in contrasting the effects of scientific and unscientific control.

Again, I do not think that the opinion of the staff who are in daily touch with the practical aspect of affairs, is sufficiently consulted. I am conscious that the Company do foster a spirit of debate between controller and controlled where any innovation is involved, but the sense of superiority of the individual-in-charge often proves an insuperable barrier such to a condescension. There are, of course, exceptions, although Mr. Hare asserts that a person is largely a creature of circumstance, which circumscribes his actions. I prefer to think that it is in the power of any man to rise above his circumstances and that they do not encircle a man and limit his activities but are rather an indication of his intellectual abilities.

The statement that the "controller" should endeavour to inoculate his subordinates with a sense of responsibility in their work cannot, I feel, be too forcibly emphasised. Monotony undoubtedly is an epidemic whose ravages have a terrible effect on any staff. Interest a man in the labour in which he is engaged by illustrating to him the utility of the same, his ambitions are refreshed, his energies revived, and the ultimate benefit to himself and to his employer cannot be gauged.

However Utopian some of Mr. Hare's views on the subject may seem, I am convinced that if their principles were more widely applied in this Company we should have better working conditions between the two factors which constitute control.

JAMES DONALDSON, jun., Test Clerk,
Pollokshields. Hillhead Exchange.

[We think Mr. Donaldson has misread Mr. Hare's article, for what Mr. Hare advocates is not concentration on one section of the Company's work but the importance of concentration on the particular work in hand at the time. We do not think, moreover, that Mr. Hare's remarks about the force of circumstances can be taken to mean that one should not rise superior to them.—ED., "N. T. J."]

REPEATING COILS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I WAS pleased to see Mr. Duncan's criticism and was interested in his remarks. When submitting the article for publication I fully expected that it would provoke a discussion of general interest and profitable nature. And other readers will, I hope, contribute their views as to the most efficient magnetisation and so forth.

I must admit that the statement to which Mr. Duncan took exception was to some extent misleading; but, if it has caused any of the readers to weigh and digest the repeater action my remarks were not misplaced.

I agree that the very rapid and varied alternations set up in the listening side of the repeater, due to variations of the transmitter in the speaking side, are superimposed on the current from the central battery; but owing to the bias given by that current the resultant effect is a rippling of the line current,

Regarding Mr. Duncan's consideration of the supervisory relay action if the resultant line current were alternating—Would not the inertia of the armature prevent it following the speech wave frequencies? An observation of the action of the party line ringing relay used in the fuse alarm circuit at central battery exchanges where the armature will at a low frequency reliably and steadily close a circuit should remove any doubt on this score.

In connection with the second portion of my article, I would point out that the numbering of the toroidal repeater terminals in Fig. 10 is a key to the theoretical connections shown, and does not refer to the later coils which are stamped $^{1}\ ^{2}\ ^{3}\ ^{4}\ ^{6}\ ^{5}\ ^{8}\ ^{7}$.

It has doubtless occurred to many that, whereas the "A" cord circuit repeater magnetisation (see Figs. 10A and B and 12A and B), is independent of line connections, with "B" cord circuits form circuit battery exchanges the repeater magnetisation would be altered by a reversal of the junction line. This applies to the No. 12, 13 or 25 repeater, and my remarks as to the magnetisation of the No. 13 repeater do not refer to junction working, under which condition the magnetisation could be as in Fig. 12B.

Metropolitan Electrician's Department. G. H. BRYANT.

Re POLE ERECTION IN LEICESTER.

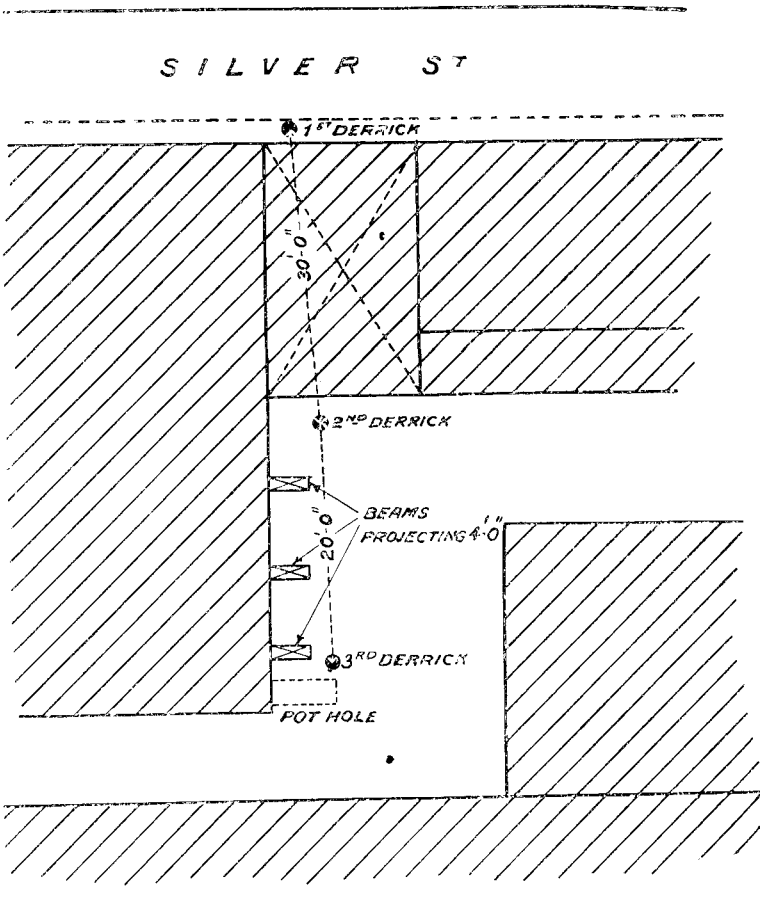
TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

IN reply to Foreman Lee's criticism in the November JOURNAL of my article under the above heading in the September issue, it would appear that Mr. Lee has not read the article as carefully as he has looked at the pictures.

In his first paragraph he suggests that the derricks are too near together, and in the last, that they are too far apart.

I carefully pointed out in my article that the third derrick was rendered necessary in order to clear the projecting beams shown on the left of (Fig. 1).

Had it not been for these the pole could have been erected from the second derrick. But to do away with the second derrick would have made the span from the first too great to be safe or practicable, without fleeting the pole in the derricks (larger derricks of course could not be used in this case); which I consider to be an unsatisfactory and unnecessarily dangerous method of



derricking a large and heavy pole, and one which should only be adopted when derricks cannot be placed near enough together to enable the tackles to be hooked on at the balance of the pole.

I enclose rough ground plan with the essential measurements. Fifteen men were employed.

Leicester, Dec. 11, A. W. GARRARD, Sub.-Engineer.

NATIONAL TELEPHONE STAFF BENEVOLENT SOCIETY ENTERTAINMENTS COMMITTEE, LONDON.

AT a meeting of the above committee, held on Nov. 5, it was agreed to adopt the balance sheet for the first whist drive held on Oct. 13, showing a nett profit of £6 7*s*. 7*d*., which figure is a record for any whist drive organised by this committee.—D. BALDWIN, hon. secretary.

METROPOLITAN PROVIDENT CLUB BALANCE SHEET, 1909.

Receipts		£717 7 11
Expenditure—Deaths of three members	30 0 0	
Sickness, 1,850 days at 1*s*. 9*d*.	161 17 6	
Withdrawals	7 3 6	
Officers' printing, postage, etc.	66 6 7	
Total expenditure		£265 7 7

Balance in hand, £452 0*s*. 4*d*. To be divided between 466 members, full members receiving £1 0*s*. 6*d*. per share.

NEWCASTLE OPERATOR'S THRIFT CLUB.

THE third general meeting of the above club was held on Dec. 17. The balance sheet was read and confirmed, showing as follows:—

Balance in hand November, 1901		£147 4 9
Cash received to November, 1909, including interest		213 19 6
Total		361 4 3
Cash paid to depositors		160 18 8
Leaving balance in bank		£200 5 7

The secretary's report shows an increased membership from 56 to 78, which speaks for the popularity of the club. A vote of thanks was passed to the retiring officers, who were unanimously re-elected for the ensuing year.

LONDON NOTES.

MR. J. C. CROWTHER, of Woodford Green, has written to the Company expressing his thanks for the promptitude with which a call was put through to the fire brigade at 3.30 a.m. on Nov. 24. The night operator's alertness enabled the brigade to save the greater part of Mr. Crowther's house and its contents from destruction. The subscriber also wrote to the local newspaper to the same effect.

ANOTHER experience of the telephone's usefulness in the Metropolitan area comes from Woolwich, where a lady notified the police of the presence of burglars. In five minutes there were ten policemen round the house. Unfortunately the intruders had heard the lady go to the telephone, and they, therefore, made off. The subscriber now has an extension instrument in her bedroom.

THE first round in the Clay Challenge Cup football competition ended in a Salisbury House win by 3 to 2. The Workshop, although beaten, put up a plucky fight. Those who witnessed the match seem agreed that the game was well contested and full of interest from start to finish. *Apropos* of football, there has been some talk of getting up a team for Brighton early in 1910. It is to be hoped that any effort to do so will meet with success, and that many of the staff will accompany the players.

THERE are a number of interesting presentations to record. Mr. Teboon, on his appointment as Exchange Manager, Westminster, was presented with a gold albert by his friends at North. Mr. F. Macaulay, who has been appointed Chief Contract Clerk, Southern District, was asked to accept a silver-mounted umbrella and walking stick by his Western colleagues. Mr. H. Pountney, Test Clerk, Holborn, was recently married to Miss E. Edmonds, formerly of the Holborn Traffic staff. He was presented with a handsome oak gate-leg table. Mr. I. Chater, another Holborn Test Clerk, was also married a few weeks ago; the wedding present from the City maintenance staff was a Standard lamp and shade.

MISS J. MCMILLAN, of the Correspondence Department, Salisbury House, has just received from the London Chamber of Commerce a special prize of £2 for proficiency in shorthand. Miss McMillan is to be congratulated on this addition to her long list of prizes and certificates.

Two of our operators—Miss D. Hatfield (Gerrard) and Miss E. Godden (Avenue)—have passed the third examination of the St. John's Ambulance Association. They are thus entitled to the Association's medallion. Three other members of the traffic staff—Miss J. Hiley and Miss C. Lawless (Gerrard) and Miss L. Coppen (Avenue)—have passed the first examination. There are now quite a number of "first aiders" amongst the staff. Whilst hoping that their services will not be in great demand, it is matter for congratulation that the interest of the staff in hospital work is not being confined to the "Saturday fund" contributions.

AS illustrating the part played by the operator's tone of voice when ministering to a subscriber's demands, comes the following incident from a West End Exchange:—Subscriber, on asking for a number, received the polite reply, "Number engaged. Shall I call you"? To which the caller, evidently in a somewhat mixed mood, responded, "Yes, please, but don't be so d——d happy about it." What the subscriber might have said had the operator not been "happy" is better left to the imagination.

MR. HARVEY SMITH'S paper on "Elementary Economics of Engineering" caused a well-sustained and interesting discussion at the last meeting of the London Telephone Society "The young lions" of the Engineer-in-Chief's Department were in great form, and contributed, in no small measure, to the success of the evening. Mr. Watts, whose contributions to debate are always welcome, paid a well-deserved tribute to the excellence of Mr. Smith's paper.

AT the traffic branch meeting on Dec. 15 two very able papers were read. One was by Miss A. Bell, on "The 'B' Operator and her Work"; the other by Mr. H. C. Townsend, on "The Registration of Calls at Central Battery Exchanges." The most enjoyable feature perhaps was the animated, spontaneous and helpful discussion. Both papers suffered somewhat owing to the small amount of time available for criticism. Many of the remarks on Miss Bell's paper were particularly bright and lively; the essayist was no less so in her replies, and her "pretty wit" enabled her to score handsomely off her critics.

THE past and present members of the Southern staff treated themselves to a dinner at the Bridge House Hotel on Dec. 10. As anyone not a "Southron" was rigidly excluded, I can only report at second-hand. Mr. H. Davis was the only possible chairman for such a gathering, and, needless to say, he proved a popular one. The musical honours with which his health was drunk were received both modestly and blushingly. An enjoyable programme of music was carried through. Gerrard, I understand, are to have a similar reunion on Jan. 7; may it be as successful and enthusiastic.

MR. CLAY recently found amongst his treasures a London Pocket Directory published in 1896. Metropolitan progress during the intervening thirteen years is in no respect better shown than in the number of call offices:—

1896	149
1909	2,989
Increase	2,840

equal to about 28 per cent. per annum.

GLASGOW NOTES.

THE operators' society and club held the second meeting of their session on the evening of Nov. 22, when papers prepared by Mrs. Reid, Travelling Supervisor, and Miss Smith, Clerk-in-Charge, Argyle Exchange, were read by Miss Smith, and were illustrated by lantern slides kindly lent by Head Office and others. At the close of the papers the second meeting of the club was held, when the members took part in a varied programme of songs and dancing.

FURTHER evidence as to the value of system in regulating our charitable efforts may be found in the accounts of the hospital and benevolent funds. The weekly "mites" contributed by the staff during the past year amounted in all to £195, and this has been allocated among the various local hospitals and charitable institutions.

A MASS meeting of the local members of the Staff Transfer Association was held on the floor of the large hall of the Royal Exchange (the use of which was kindly granted for the occasion) on the evening of Friday, Dec. 10. The local committee gave an account of their stewardship, and the meeting was also addressed by Mr. Valentine, who represented the Central Committee.

A VERY pleasing ceremony took place on Dec. 8, when Mr. George Johnstone, Assistant Engineer, was presented with a "grandfather" clock and a brooch for Mrs. Johnstone, on the occasion of his completing 25 years' service with the company. Mr. Johnstone is a deservedly popular member of the Glasgow staff, and on making the presentation Mr. Valentine spoke of his recognised worth as a man and as an engineer. Communications of recognition and congratulation from Mr. F. Douglas Watson and Mr. Dane Sinclair were read.

THE third meeting of the National Telephone Society was held in the Technical College on Dec. 8, when Mr. J. K. Murray read a paper on "Procedure in Telephone Engineering," which was illustrated by limelight views and diagrams. The underlying note of the paper was the necessity for thinking out the various problems as a preliminary to all engineering works. A lively discussion followed, one of the points of dispute being the relative merits of ropes and chains for use in connection with the erection of poles.

THE first step in the amalgamation of the Company's and the Post Office exchanges in Glasgow was taken on Saturday, Nov. 27, when the Post Office subscribers on "Western" were transferred to Hillhead. The change-over was carried through successfully, and the joint service is working very smoothly.

WE are now in the midst of the dancing season. The office dance was held in the Masonic Halls, Berkeley Terrace, on the evening of Dec. 4, and the Douglas Exchange operating staff held their annual dance on Dec. 7 in the Prince of Wales' Hall (Kunzles), Sauchiehall Street. Both functions were very enjoyable and proved highly successful.

THE returns of the Traffic Department Benevolent Fund show receipts totalling to £136 14*s.* 6*d.* and an expenditure of £42 16*s.* 11*d.* This is a useful institution.

IN these hard times most business concerns find it no easy task to make ends meet, but not so our magazine and book club. Not only has it satisfied the literary appetite of the staff, but now, at the end of its fifth financial year, it has, as is its annual custom, declared a dividend.

UNDER the auspices of the senior officers of the Traffic Department a whist drive was held in Miss Cranston's, Buchanan Street, on the evening of Wednesday, Dec. 15. The party numbered 124, and included the Superintendent for Scotland and Mrs. Watson (who presented the prizes), and the District Manager and Mrs. Valentine. During an interval in the proceedings tea was served, and the company broke up about 11 p.m. The evening was a highly successful one and credit for this is mainly due to the committee for the excellent manner in which their arrangements were carried out.

LOCAL TELEPHONE SOCIETIES.

Birmingham.—The third meeting was held in the operators' dining room, Central Exchange, on Dec. 7, when a paper was read by Mr. Gatty, entitled "Private Branch Exchanges." The paper dealt first with the advantages of the private branch exchange system and gave a description of its special features. Afterwards each pattern of central battery switchboard was dealt with, a description of the switchboards following illustrated by lantern slides. An interesting discussion followed.

Blackburn.—The second meeting of the session was held in Swift's Rooms, Blackburn, on Dec. 12, at which Mr. J. Airey, Cost Clerk, Blackburn, read a paper entitled "Expenditure." The subject was dealt with very fully and in a most interesting manner. Mr. Slater criticised, and afterwards a very keen discussion followed, many members taking part in the same.

Bournemouth.—The third ordinary meeting was held on Dec. 13, when Mr. S. A. Blewden delivered a paper on "A Comparative Study in Instrument Department Organisation," illustrated by diagrams. The paper was very much appreciated by a good attendance, and a considerable discussion took place, in which Messrs. Moore, Plummer, Hunt, Price, Harper, and Skinner took part. Mr. Harper (Local Manager) was in the chair.

Bradford.—The monthly meeting of this society was held on Dec. 8, the president, Mr. G. W. Wicker, being in the chair. The subject was "The Commercial aspect of the Company's Business," introduced by Mr. T. W. Jowett, Contract Manager. Diagrams bearing on the subject matter of the paper and a number of slides were exhibited.

Bristol.—The third sessional meeting was held on Dec. 16, when a paper was given by Mr. J. Wilkins, District Office Staff, on the "Life of a Works Order" and "Compilation of the Telephone Directory." There was a prompt and animated discussion, and although the inclement weather militated against the attendance, a most enjoyable evening was spent. Mr. Perkins (District Manager) was in the chair.

Bristol Operators.—The third sessional meeting was held on Dec. 16, when four papers were given by members of the Bristol operating staff as below: (1) "Imaginary Conversation by a Telephone," by Miss D. Davis; (2) "A Senior Operator as Helpmate to a Learner," by Miss D. Bubbear; (3) "Telephone Subscribers and Their Ways," by Miss D. Hazell; and (4) "Confidence between Subscribers and Operators," by Miss E. Thorne. The papers were highly appreciated by an attendance of 62, representing 94 per cent. of staff, and an interesting discussion ensued. Mr. Perkins (District Manager) occupied the chair.

Cardiff.—The third meeting, held on Nov. 18, was well attended. This night was devoted to competitive papers on "Instrument Maintenance," to be read by instrument inspectors. Four papers were read by the following:—Inspectors T. H. Elleby, W. H. Cooke, H. Wibberley and A. G. Payne. The first prize was awarded to Inspector Cooke, and the second to Inspector Wibberley. The latter part of the evening was taken up with a paper on the same subject, read by Mr. B. Waite, which was thoroughly appreciated by all present. An interesting discussion followed, after which the meeting was brought to a close.

Cheltenham.—The second meeting was held on Nov. 9, 94·1 per cent of the members being present. Mr. A. D. Pike's paper, "General," was read, and proved an illuminating agent on such diverse subjects as telephone societies and their value to the Company and staff, contract and wayleave officers' duties, various types of directories, "outside" *versus* "inside" call offices and service tests, concluding with a short discourse on mercury vapour lamps.

The third meeting was held on Nov. 23, 100 per cent. of the members being present. Mr. A. D. Pike was in the chair, in the unavoidable absence of the president, Mr. C. E. Elliott. Mr. A. H. Guppy's paper, "Faults and Filing," and Mr. W. A. Taylor's "Clerical Fragments" were read, and produced an interesting discussion.

Douglas.—The fifth meeting was held on Nov. 26, the District Manager presiding, when a paper was read by Mr. A. Smith, Line Foreman, on "The Twist System of Wiring." The District Manager explained the scientific principles of the system, and the lecturer very carefully explained the plan of running wires on the twist by means of blackboard diagrams and by models, which were most interesting and instructive. Considerable discussion followed the reading of the paper.

The sixth meeting was held on Dec. 10. A paper was read by Mr. E. Cowley, second Clerk, on "The Measured Rate." The District Manager, who presided, introduced the lecturer, and explained that he wished the whole of the staff to understand thoroughly the basis of the measured rate. The paper was most instructive, and was followed by a most interesting discussion.

Hastings and Eastbourne.—A meeting was held on Nov. 17 at the Y.M.C.A., Eastbourne, Mr. H. A. Hemstock giving an interesting paper on "Wayleaving and Wayleave Difficulties" Twenty-six members were present, and Mr. E. Armstrong (Local Manager, Hastings) was in the chair.

The third meeting was held on Dec. 16 at the Y.M.C.A. Rooms, Hastings. Thirty-two members were present including twelve from Eastbourne with Mr. R. Curling, the Local Manager. Miss Sims, Clerk-in-Charge, Hastings, read an interesting paper on "Operating and Patience," which was much appreciated. On conclusion of the paper a discussion followed, Miss Sims dealing with the various queries in an able manner. Mr. E. Armstrong, Local Manager, Hastings, was in the chair.

Liverpool and Birkenhead.—The second meeting took place at the Clarion Café on Nov. 18. Mr. Latimer, Head Office, read a paper on "The Manufacture of Dry-Core Cable." The lecture (which was profusely illustrated with some exceptionally fine slides) was followed with great attention by the members present, and a very interesting evening was brought to a close by a keen discussion on various points connected with the subject. A very good model of the lead press used by the British Insulated Company was exhibited.

London.—A meeting was held at Salisbury House on Dec. 6, with an attendance of 85, Mr. L. Harvey Lowe being in the chair. The Chairman complimented Mr. Harvey A. Smith on his success as being the winner, so far as this society is concerned, of the competition on outside engineering, and asked him to read his paper entitled "Elementary Engineering Economics." A most interesting discussion was entered into by the following members:—Messrs. W. B. Crompton, G. F. Greenham, W. H. Harding, E. S. Byng, C. E. Tattersall, D. Fulton, A. Watts, J. W. Wheeler and J. M. Shackleton.

London (Traffic Branch).—The third meeting of the session was held in the Great Hall, Salisbury House, on Dec. 15, Miss F. J. Minter being in the chair. There were 182 members present. Miss A. Bell, Supervisor, Bank Exchange, gave a bright and interesting paper, entitled "The 'B' Operator, her Work and her Difficulties," which led to a very interesting discussion on the service from the "B" operator's point of view. Mr. H. C. Townsend, Exchange Manager, Dalston, gave a paper, "The Registration of Calls on the Central Battery System." There was also an animated discussion on this paper, and it is obvious that the members of the traffic branch have taken the remarks in the last number of the JOURNAL to heart. The following members joined in the discussions:—Misses Mobley, Reekie, Higham, Sayer, Ralph, Newman, Smith, Reid, Liddell, Hooper, Bailey, Berry, and Messrs. Collins, Abbott, Edmonds, Stirling, Webb and Deane.

Newcastle.—The third meeting was held on Dec. 7, with Mr. J. Gwyther in the chair. Three papers were given. The first, by Mr. G. Lyford, was on "Fault Card and Docket System"; the second, by J. Hastings, on "Testroom Work"; and the third, by F. W. Dickinson, upon the "Budget." After each paper there was considerable discussion, in which the following members took part:—Messrs. F. Atherton, G. Marshall, J. E. Jordan, E. T. Payne, J. Gwyther (chairman), J. Lacroix (auditor), T. Bell, J. Hastings, O. Preston, C. W. Hall, R. W. Jackson, J. Bellerby, W. H. Abbot and F. W. Gaskins.

North-East London.—The second meeting was held on Nov. 25 at the Dalston Exchange, chairman Mr. H. S. Peck, when Mr. D. Morley Ward (the president of the society) read a paper on the "Fundamental Principles of Electricity." This proved to be very interesting, and was keenly followed by the members present, as also were the neat set of diagrams done by Mr. Ward to illustrate his lecture.

Northampton.—A meeting was held on Nov. 30 in the inspectors' room at the Northampon Exchange, when the officers for the year were elected, and afterwards a paper was given by Mr. W. Dickinson entitled "A Few Notes on Operating," after which a general discussion followed.

Coventry.—A meeting was held on Nov. 29, at Priory Row Assembly Rooms, when Mr. J. Mewburn presided over a fair attendance of members. Mr. H. Green (Engineer-in-Chief's Department) gave a limelight lantern lecture on "Cable Design."

Nottingham.—The second meeting was held on Nov. 19, when a paper was read by Miss Barker on "Monitors' Duties." At the conclusion of the paper considerable discussion took place, members of the various staffs taking part.

The third meeting was held Dec. 10, a paper being read by Mr. E. Earp, Exchange Inspector, on "Transmission," illustrated by lantern slides. A discussion took place at the end of the meeting relative to the utility of additional instruments for transmission being included in the test clerk's equipment

Nottingham Factory.—The second meeting took place on Nov. 22. Mr. Fenton presiding, 89 present. Under the title of "Central Battery Exchange Working," a very interesting and instructive paper, illustrated by lantern slides, was read by Mr. F. McDougald of the Sundry Repairs Department, Nottingham Factory. After describing in detail the various apparatus contained in the apparatus room, and explaining their functions, a short description of the switch-room was given, the various apparatus on the switchboard being mentioned, and the method of operating described in detail. A brief discussion brought the meeting to a close.

The third meeting took place on Dec. 6, Mr. Fenton in the chair, 115 present, when Mr. Mr. A. J. Bone gave his second demonstration of the methods employed in electro plating and polishing of metals, the following processes being dealt with:—The preparation of articles for plating, with special reference to the processes of "sanding," "emery bobbing" and "electro cleaning"; copper plating, nickel plating, silver plating; the finishing of articles after leaving the vats, also bronzing. Besides having cleaning apparatus and plating vats actually working, Mr. Bone had on view samples of the chemicals used to form the various plating solutions, together with some fine examples of finished work, which were greatly admired.

Stirling.—The third meeting was held at Falkirk on the evening of Nov. 30, and there was a good turn-out of the members. A paper was read by W. Barclay, Assistant Engineer and Electrician on "The Telephone Past and Present," and in a carefully prepared paper he thoroughly explained the various steps which had taken place in the evolution of the telephone instrument, the lecture being illustrated by lantern slides. A number of the members afterwards joined in an interesting discussion.

The fourth meeting of the session was held on Dec. 14, when Mr. Morton, the local Contract Officer, read a paper on "Canvassing." The commercial side of the business was fully dealt with and a number of interesting suggestions made. A discussion took place among those present at the close of the paper.

Southern (London).—A meeting of this society was held on Nov. 22, when Mr. G. Disspain read a paper on "Faultfinders and their Troubles." The paper was well illustrated with lantern slides and several samples of joints, etc., were exhibited. A good discussion followed the reading.

Warrington.—"Traffic" was the title of a paper given by Mr. G. F. Staite, of Manchester, before 47 members of the above society and four lady friends, at the third sessional meeting held on Dec. 15, and presided over by Mr. W. Beattie, Local Manager, Wigan.

Weymouth.—The second meeting was held on Dec. 9. Mr. J. A. Attwooll (Local Manager) taking the chair. Papers given respectively by Miss C. Harper and Mr. F. W. Richards, entitled "The Annual Meeting of Officers, and its Bearing on our Local Arrangements" were read. There was a very good attendance of members notwithstanding the inclemency of the weather.

Bolton.—On Nov. 25 Mr. Frost, Engineer, Blackburn, gave a very interesting paper on "Overhead and Underground Construction." The remarkably good lantern slides and coloured plans contributed to the success of the lecture. An interesting discussion on maintenance costs in relation to good and bad construction and other points ensued.

On Dec. 16 Mr. F. Ratcliffe, Exchange Inspector, Bolton, read a paper on "The Subscriber and his Service." The part played by the subscriber in influencing the efficiency of the service and the means of educating him to a responsible view of his methods was enlarged upon. The subject was illustrated by large scale diagrams and a number of suggestions were keenly discussed. The operators were invited and a number attended.

Plymouth.—A meeting took place on Dec. 1 when Mr. R. A. Dalzell gave a very interesting paper entitled "Some Problems in Distribution." The paper showed how the traffic load could be equalised by the proper distribution of lines on the switchboard.

Cork.—The second meeting was held on Nov. 25, Mr. A. M. Kidd (District Manager) presiding, when Mr. R. Morgan, Traffic Manager, Dublin, read a paper, entitled "The Lost Call and Accuracy in Recording." The chairman, Mr. Lynn,

Miss Gallagher and Mr. Roy having spoken on the paper, a hearty vote of thanks to Mr. Morgan brought the meeting to a close.

The third meeting was held on Dec. 16, the president (Mr. Lynn) being in the chair, at which another very interesting paper, entitled "Post Office and Junction Fees," was read by Miss H. Peard. An interesting discussion, taken part in by the president, Miss Gallagher, Mr. Roy and Mr. Henry, followed.

Dover.—The third meeting of the session was held on Dec. 14, in the St. James's Parish Hall, when Mr. E. J. Woods, Local Manager, Margate, gave a lecture illustrated by lantern views, entitled "Change from Electric Circuit Overhead Magneto to Metallic Circuit Underground at Cambridge." The subject was very ably dealt with. After the lecture a number of slides, kindly lent by the Cunard Steamship Company, were thrown on the screen. Sixty-four per cent. of the members were present and nine visitors.

Sunderland and Shields.—The third monthly meeting was held on Nov. 26, Mr. E. Spink presided. The minutes of the previous meeting were read and confirmed. Two interesting papers were given, the first by Mr. N. Livingstone on "Testing," and the second by Mr. N. E. Tinwell on "Common Battery Calling Circuits," together with working of line and cut-off relay and pilot relay. Discussion took place on these items.

The fourth monthly meeting was held on Dec. 17 at Sunderland, Mr. E. Spink being in the chair. Two interesting and instructive papers were given. First, by Mr. W. H. Abbott, on "Railway Wayleaves," and the second, by Mr. T. Byrne, on "Automatic *v.* Manual Telephony."

Birmingham Operators.—The third meeting of the session was held on Dec. 17, in the Central operators' dining room, Miss H. Crowther, Clerk-in-charge of East Exchange, being in the chair. A very interesting paper was given by Mr. Francis, of Liverpool, the subject being "Supervision in Exchanges." During the lecture several items of importance were dealt with, and a very enthusiastic discussion followed.

Dundee.—At a well-attended meeting of the district staff held on Nov. 12, it was decided to form a telephone society, meetings to be held monthly. The following office-bearers were elected:—President, Mr. W. Brown, District Manager; vice-president, Mr. A. Mackenzie, Traffic Manager; secretary, Mr. M. McEwan; treasurer, Mr. G. Wanless; committee, Miss Abbot and Messrs. Hobson and Harper. The December meeting was held on Dec. 14, Mr. W. Brown presiding, when to a large attendance of members Mr. J. W. Hobson read an interesting and instructive paper on "Overhead Construction."

Hull.—The second meeting of the session was held on Nov. 25, and a paper entitled "The New Post Office Trunk Switchboard, Hull," was given by the District Manager (Mr. C. C. Worte). Lantern slides showing the switchboard and other apparatus were thrown on the screen and explicitly explained by the lecturer.

Manchester.—The C.D. Club held their second meeting on Nov. 15. Mr. Southern was in the chair. Mr. Staite, Traffic Manager, spoke on "Grouping of Lines," "Operating at Private Branch Exchanges" and the "Measured Rate." The lively interest on the points brought out and discussed was more than sufficient testimony to the value of such meetings to contract men and gave much satisfaction to the lecturer. The meeting concluded with a musical programme.

Luton.—On Dec. 13 Mr. S. Moody, Local Manager, Luton, read his paper entitled "Traffic" to a large meeting of the staff. Through the courtesy of the Metropolitan officials Mr. Moody was enabled to spend a day in the various London exchanges collecting information which he embodied in his paper. A number of operators from all parts of the district were present.
Add Cheltenham

The fourth meeting was held on Dec. 14, 100 per cent. of the members being present. Mr. R. T. McCahey gave an interesting paper on "Power Plant," specially mentioning the Nodon valve and Mercury arc rectifiers, maximum demand meters and the theory of continuous current dynamos.

Swansea Operators.—The third sessional meeting was held at the Docks Exchange Hall on Dec. 8, Mr. W. H. Crook (Chief Clerk) occupying the chair, when the following very interesting papers were read by members of the operating staff:—"Enthusiasm, an Essential to a Good Operator," by Miss M. Sweeney; "Call Wire Working," by Miss L. Howell; "Private Branch Exchange Working," by Miss L. Rees; and "Team Working and the Captain of a Team from a Junior's Point of View," by Miss Q. Le Dong. The papers were admirably written, and provoked an animated discussion, participated in by practically all present.

Swansea.—The third meeting of the session took place at the Docks Exchange Hall on Dec. 13, W. E. Gauntlett (District Manager) occupying the chair, when an extremely interesting and instructive paper was given by Mr. A. L. Stanton on "The Fundamentals of Efficient Service." The paper is being submitted to Head Office in competition.

North Midland.—The December meeting took place on Dec. 13 at the Midland Café, Wolverhampton. The lecturers were Messrs. C. F. Spears on "Contract Work" and H. T. Warrand on "Electrical Measurements" (illustrated by experiments). Both papers were keenly followed by an audience of 40. Chairman, Mr. C. H. Johnston.

Sheffield.—The second meeting was held at the Central Café on Nov. 19. Mr. F. Barr occupied the chair. A paper was read by Mr. R. Gillett on "Automatic Boxes," and was illustrated by a number of lantern slides. The paper proved very interesting and considerable discussion took place.

The third meeting was held at the same place on Dec. 10. Mr. F. Barr presided. Mr. E. J. Johnson read his paper entitled, "A Talk about Traffic Matters." The paper caused a large amount of discussion.

Leeds.—At the meeting held on Dec. 8, Mr. T. W. Baker read a paper on "Inside Plant," with subdivisions: Subscribers' installations, testroom, switchroom and power plant. The paper was well received and provoked a good discussion.

NEWS OF THE STAFF.

Mr. C. E. FENTON, the Manager of Nottingham Factory, on Dec. 27 completed 21 years' service with the Company.

Mr. E. T. MARTIN has been transferred from Pontypridd to Plymouth as Storekeeper.

Mr. W. S. GRIFFITHS has been transferred from Plymouth to Bath as Assistant Engineer.

On resigning the Company's service Mr. FRANCIS HARMAN ELGIE, Wayleave Officer, Dover, was presented with an ivory carving representing Westminster Abbey. The Local Manager, in making the presentation on behalf of the staff, wished Mr. Elgie every success in his new sphere.

Mr. G. A. KNIGHT, Local Office Clerk at Lancaster, has been transferred to Preston District Office as Cash Book Clerk. He was presented by the Local Staff with a dressing case.

Mr. A. T. TAYLOR, Cheltenham, was presented with a silver clock on his promotion to Neath.

Mr. W. H. A. COLES, on his transfer from Cheltenham to Chippenham as Lineman-Inspector, was presented with a leather kit bag.

Foreman M. JENKINS has been transferred from Bristol to Cheltenham.

Mr. J. JAMES, Local Manager, Cardiff, has been appointed Engineer.

Mr. W. J. MARSH, Exchange Manager, Cardiff, has been appointed Traffic Manager (Cardiff District).

Mr. S. F. WHETTON, Chief Inspector, Cardiff, has been appointed Electrician.

Miss HELEN MOORE, Operator, Brighton, has been transferred to Woking as Chief Operator, and on leaving Brighton was presented by the operating staff with a brooch and handbag.

Messrs. G. H. CARRIER and E. ROBINSON have passed the examination in the second year's course of electrical engineering at the Nottingham University College.

Mr. H. C. FLINT, Observation Officer, Birmingham, has been transferred to Leicester as Instrument Inspector. On leaving Birmingham he was presented by the Traffic Manager with a gold-mounted fountain pen on behalf of the members of the Traffic Department.

Mr. N. T. OWEN, Inspector, Neath, has been transferred to Stroud in a similar capacity.

The Company has made a grant of £10 to the widow of C. W. TUGWELL, of Watford, whose death was reported in the November JOURNAL.

A presentation of a purse was made to Linesman J. DOUGLAS, Newcastle-on-Tyne, on Nov. 22, consequent upon his resignation in order to depart with his family to New Zealand.

Metropolitan Staff Alterations:

Mr. N. BRAYBON, Clerk, Superintendent's Office, has been appointed Engineer's Clerk, Sydenham.

Mr. G. F. TERRY, Wayleave Officer, Dalston, has been appointed Assistant Engineer, Battersea.

Mr. F. G. ASHTON, Engineer's Clerk, Sydenham, has resigned the service.

Mr. F. HODSDON, Engineer's Clerk, Hop, has been appointed Engineer's Clerk, Battersea.

Mr. J. W. MARSHALL, Contract Clerk, East, has been appointed Contract Officer, East.

Mr. J. WINTERSGILL, Engineer's Clerk, City, has been transferred to the Metropolitan Engineer's Department.

Mr. A. PEACH, Engineer's Clerk, Battersea, has been transferred to the City in a similar capacity.

Mr. J. KELLY, Foreman, retired on pension on Oct. 16. He entered the service in February, 1886, and has thus completed over 23 years' service.

London Traffic Department:

On Dec. 6 a presentation of an oak bureau and bookcase was made to Mr. PAUL J. MANTLE, Exchange Manager, by the staff at Avenue, on the occasion of his transfer to a similar position at London Wall. The gift was accompanied by their heartiest good wishes.

Miss KATHLEEN BARNWELL, on leaving the Company's service as an operator at Kensington, to go abroad, was presented with a Gladstone bag by her colleagues.

MARRIAGES.

Miss CHRISTINA A. MACKENZIE, operator in Edinburgh Central, has resigned to be married. She was presented with a very pretty dinner service and an *epergne*.

Miss LIZZIE STEWART, Senior Operator, Dundee Exchange, who has left the service to be married, was presented by the Traffic Manager, on behalf of the operating staff, with a case of silver teaspoons and cake basket.

Mr. J. HEWITT, Cashier, Warrington, was, prior to his recent marriage, presented with a handsome marble clock, a pair of marley horses and a pipe. On behalf of the staff, the presentation was made on Dec. 17 by the District Manager, Mr. H. Chambers, who referred to the esteem and popularity of Mr. Hewitt, and wished him and his future bride a long and happy life.

Mr. F. P. LAMPARD, Test Department, Engineer-in-Chief's staff, was presented by his colleagues with a case of cutlery on the occasion of his marriage.

Mr. L. H. SLATER, Local Office Clerk, at Blackpool, was the recipient of a suitable present on the occasion of his marriage on Nov. 18.

Miss MARY ELLEN FULLAGAR, Operator at Cheriton Exchange, on leaving the Company's service to be married, was presented by the Folkestone staff with a handbag.

Miss BERTHA BROOKER, Operator, Palmers Green, on leaving to be married was presented by her colleagues and also friends at Dalston, where she had previously held the position of operator, with a brass spirit kettle and stand.

STAFF GATHERINGS AND SPORTS.

Paisley.—The first of a series of whist drives was held in Hutton's Restaurant, Moss Street, on Dec. 10. The prizes given by the District Manager, Mr. A. R Lamb, and by the Local Manager, Mr. R. Audsley, were won by Miss Bella McLean and Mr. H. R. Lindsay respectively. They were presented by the Local Manager, and everyone voted the function a decided success. There is a talk of challenging the district office, Greenock, but that is another story.

Hull.—On Dec. 16 the Hull staff cricket and tennis club held their annual dance at the St. George's Hall. A good company was in attendance and the dance was thoroughly enjoyed by all participants.

South Shields.—The third annual whist drive and dance was held on Nov. 17 in the Crown Assembly Rooms, South Shields. Whist was commenced at 8 p.m. and continued till 10 p.m., when at the conclusion of the 23rd game the Local Manager, Mr. W. J. Douglas, presented the prizes. After light refreshment over 50 couples occupied the floor until 2 a.m., when the programme of sixteen dances was completed. A most enjoyable evening was spent, and much good humour was exchanged in the special car engaged to take the tired but jovial spirits to their respective homes.

Preston.—A football match was played between the Blackpool and Preston staffs on the latter's ground on Nov. 20. After a spirited game the home side won by three goals to two. The party then adjourned to the Hotel National where tea was provided and a convivial evening was spent.

Middlesbrough.—The Middlesbrough centre staff held their annual dance on Nov. 5 in the Co-operative Hall, Middlesbrough. Under the guidance of Mr. W. A. Nicholson, Local Manager, and Mr. C. F. Metcalf, Chief Foreman, dancing was indulged in until 3 a.m., the event being greatly appreciated by the staff and friends (numbering about 70 couples) present.

Cardiff.—The annual social gathering of the district staff was held at the Whitehall Rooms, Cardiff, on Nov. 26. The gathering numbered about 165 of the staff and their friends. Whist and dancing, interspersed with musical items, were indulged in during the evening and our thanks are due to Miss Merrett and Messrs. Tony Lucas and Mees for so generously contributing musically towards the evening's enjoyment. Eight prizes were offered for the whist and the two given by Mr. Feddon and Mr. Dalzell were won by Miss James and Mr. H. Brooks, Cardiff A very happy evening was spent and the function was brought to a close by about 2 a.m.

Ipswich.—The staff held their first whist drive on Dec. 8 in the Co-operative Hall. There were 76 of the staff and friends present. The lady members of the committee had decorated the hall very artistically with evergreens, and they are also to be congratulated on the catering arrangements, which they carried out in a very efficient manner. Only one out of eight prizes was secured by a member of the staff, Contract Officer Nickels winning the smoking cabinet which was given by Mr. Mackie (District Manager) as a gentlemen's first. The prizes were presented with a few appropriate remarks by Miss Mackie. Mr. A. M. Fletcher acted as M.C.

Mid-Lanark.—On Nov. 27 the Mid-Lanark district staff, to the number of 35, representative of all grades, paid a visit to the latest word on central battery equipment, as housed in the new Hillhead Exchange, Glasgow. The party was met by Mr. Allan, Chief Electrician for the Glasgow district, who gave a very clear explanation on the technical and mechanical side of the equipment. Much interest was manifested by the Mid-Lanark staff in the test and power rooms, and the easy language of explanation used by Mr. Allan conveyed to the merest novice the purpose and work of all the apparatus. The party next visited the switchroom, where they were carefully piloted and instructed by Mr. Carter, Exchange Manager, Miss Cunningham, Clerk-in-Charge, Miss Sherry, and the Supervisors on duty. This section of the plant, whilst it appealed to all, was of special interest to the Mid-Lanark operators (seventeen of whom were present), and who all evinced a keenness in studying and mastering central battery methods. After a profitable hour spent in the switchroom, the party adjourned to the operators' dining room for tea, which had been provided by the Company, and which was very much enjoyed, more particularly when it was discovered that the supervisors themselves had specially baked a number of the cakes for the visitors. After tea the party visited the operators' quarters, where splendid accommodation has been placed at the disposal of the staff. Before leaving, Mr. Whitelaw, District Manager, in a few words, thanked the Glasgow staff for their kindness, and in the name of the staff and himself expressed the pleasure and enjoyment which they had received during the afternoon.

Plymouth.—A whist drive and dance took place at the Mikado Café, Plymouth, on Nov. 26, at which 50 members of the staff and their friends were present, including Mr. G. Hooper (District Manager) and Mrs. Hooper. The whist drive prizes were won by the following:—Misses Payne, Reuter and Lawrence; Messrs. Hitchens, Ferris and Balls. After the whist drive dancing was carried on until 1 a.m., when the gathering broke up after having spent a most enjoyable evening.

Sheffield.—In connection with the holiday club a dinner and entertainment was arranged, and took place at the Exchange Restaurant on Dec. 17. Over 60 members of the staff were present and thoroughly enjoyed a substantial and excellently served repast. A very interesting programme had been arranged, all the artists being staff members. The outstanding feature was a mock election, four candidates most eloquently expressing their extraordinary virtues in a manner which left no doubt as to the sincerity and ultimate fulfilment of their promises. Mr. R. C. Bennett, the District Manager, presided.

Birmingham.—The District Office Football Team continued their victorious career in the football match with the Central Testroom staff on Nov. 21, when the latter were defeated by three goals to *nil*. All three goals were secured in the first half. The District Office were unable to add to the score during the first half, although for the most part they were pressing, but failed to make the best of opportunities which repeatedly presented themselves. A challenge has been received from the Inspectors' Department, and this game is looked forward to with considerable interest, and bids fair to be the match of the season on account of the number of footballers available on the inspecting staff.

Liverpool Swimming Club.—On Nov. 15 a very interesting meeting took place in the District Manager's office, when the president, Mr. E. J. Hidden, distributed the Royal Life Saving Proficiency certificates and bronze medallions to eight members of the club. The recipients were Messrs. F. C. Burstall, J. A. Mullins, A. Bell, G. Johnson, H. Lundy, H. Qualtrough, A. Brundritt and E. Mayers. The Life Saving Society's Examiner, Mr. Warriner, when he

had completed his examination said that he had never inspected a class so proficient in all departments of the science, and he congratulated them and their instructor upon the manner in which the various tests had been carried out. As Mr. Warriner has examined a large number of classes all over the country, the club felt that this success should not pass unrecognised, so Mr. Hidden, on behalf of some of the members, presented the instructor, Mr. H. W. Johnson, with a case of pipes as a token of their regard.

Manchester.—In connection with the "City" clerical and operating staffs, a whist drive was held on Dec. 6 at the Clerks' Café, Lever Sreet. There was an attendance of over 180 members of the staff and friends, and a very enjoyable time was spent. The prize winners were as under:—Ladies: Misses Sales, Matthews, Howard, Smyth and Openshaw. Gentlemen: Messrs. Drabble, Reilly, Sawyer and Picker. Mr. A. C. Godfrey officiated as M.C.

Blackburn.—On Dec. 10 the sixth annual dance of the Blackburn staff was held in the Masonic Rooms, Blackburn. About 70 members and friends were present and a most enjoyable evening was spent. Much credit is due to Mr. R. Anderson, and Mr. J. Slater for the manner in which all the arrangements were carried out.

Bristol.—A successful whist drive was held by the members of the Bristol staff on Dec. 11 at the Cadena Café, Wine Street, 99 persons participated in it, and a most enjoyable time was spent. Mr. E. Seymour Cooper is to be congratulated upon the efficient arrangements made and organisation generally.

Greenock.—The third meeting of the telephone society was held on Dec. 18. The evening was devoted to social entertainment, which took the form of a whist drive. There were seven tables and the game was carried on with enthusiasm till about nine o'clock, when an interval had been arranged for tea. The prizes were distributed by Mr. A. Ramsay Lamb (District Manager), and consisted of a lady's handbag, some confections, a walking stick and mechanical toy. These were won respectively by Miss M. Campbell and Miss M. Brown, Mr. G. Archibald and Mr. J. Lowe.

THE NATIONAL TELEPHONE STAFF BENEVOLENT SOCIETY, LONDON.

The following grants were made during the month of November:—

Workshops (three)	£9	15 0
Engineers(two)	5	5 0

Total number of grants made since formation of society—215, value £653 14*s.* 10*d.*

Donations received: £13 2*s.* 10*d.*

Total number of members at Nov. 30, 2,767.

EDINBURGH TELEPHONE THRIFT CLUB.

THE annual meeting of this club took place on Dec. 14, Mr. Robt. C. Wilson, vice-president, in the chair. The treasurer's report showed that the deposits for the year amounted to £433, and the amount withdrawn to £428, leaving a balance (with that of the previous year) of £94. It also afforded interesting comparisons with the results of the previous year, showing its decided usefulness to a membership of 196, being an increase of 23. Mr. J. Robertson, Electrician, took the chair while the office-bearers were re-elected, and elected Miss M. Ross and Miss M. Young and Mr. George Colquhoun vice Messrs. Jas. Graham, J. M. Brown and J. W. Hobson. A small committee was also appointed to arrange for some acknowledgment of the services of the treasurer, Mr. A. F. Dunn.

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TELEPHONE MEN.

XLV.—ELLIS JOHN HIDDEN.

ELLIS JOHN HIDDEN was born in London within the sound of Bow Bells, and educated at Russell Hill, Purley. He afterwards obtained electrical training at the Finsbury Technical School. His first connection with telephony was in March, 1886, when he joined the United Telephone Company and made a start on the electrical staff at Oxford Court under Mr. R. P. Wilson and the present Assistant Engineer-in-Chief, Mr. W. W. Cook.

In these early days of telephone development the work was particularly interesting, covering as it did all branches of electrical work, and the switchboards and apparatus were of a very varied nature, consisting of Bell slipper boards, Edison peg boards, flat slipper pattern boards on the multiple system, and branching jack multiple boards. The maintenance staff were very much dependent upon their own resources in clearing trouble on the switchboards. It seems a far cry in these days of common battery boards, when a portable testing set is provided which will locate about twenty different kinds of faults, by merely pressing a button or putting over a lever, back to those days when to clear a fault on the Edison peg boards an inspector carried only a screwdriver, galvanometer and a piece of stiff notepaper. The faults were generally "earths" (the circuits being single) or contact on the brass strips caused through brass filings.

In 1894 Mr. Calder, at that time Metropolitan Manager, appointed Mr. Hidden Assistant Engineer with headquarters at Heddon Street. Mr. Turner was then Manager for the West End or No. 2 division. While Mr. Hidden was in charge there the old Pelican Club was taken by the Company and a switchboard of the Antwerp type, the first of its kind in London, was fitted under his supervision.

In 1896 he was appointed Electrician for the City division, and in 1899 joined the staff of the Northampton Institute, giving a series of special classes on wiring and jointing.

Mr. Hidden received further promotion in January, 1900, when he was appointed District Manager at Liverpool. He had only been in the district a few days when the line staff, apparently thinking it an opportune time to air their grievances, went out on strike. This, however, at least gave him an opportunity of becoming quickly acquainted with a large and important section of the staff, and a settlement being satisfactorily arranged, the good relations have since existed between him and the men, and indeed with all the staff.

In 1901 the decentralisation of the principal exchange and the centralisation of several of the small exchanges, was started by the building and fitting of the Royal Exchange. The board was fitted with lamps in place of indicators, with a view to its ultimate conversion to common battery working when other exchanges in the district had been converted, magneto instruments at the subscribers' offices being retained meanwhile.

On his transfer from London Mr. Hidden took particular interest in developing private branch exchanges in Liverpool and also in the introduction of special operators provided by the Company to work them. These private branch exchanges have been responsible to a large extent for the high calling rate on the measured rate service in Liverpool. This class of service now represents 40 per cent. of the total stations, and the number of private branch exchanges in Liverpool is now 340, with 949 junctions and 2,141 stations.

In July, 1909, Birkenhead was added to the Liverpool area, this bringing the total number of lines in the district up to 21,700, and the stations to 27,500, yielding the largest revenue of any district except London.

Mr. Hidden has always been particularly interested in the education of the staff and has taken a prominent part in their amusements. In 1901-2 he re-started the telephone society, which had expired in 1898, and is proud of the fact that the example was instrumental in setting the ball rolling in the other districts and

has resulted in the present large number of successful societies both technical and operating.

On the formation of the Central Committee of the Staff Transfer Association he was nominated, but declined to stand, believing that he could serve the Association as well outside the committee. He has taken a very keen interest in the work, and has been chairman of the local society since its inception, and was responsible for the Liverpool meetings resulting in the Derby conference.

In 1900 Mr. Hidden was elected a member of the Liverpool Engineering Society, and read a paper on "Telephone Development" before the society in December, 1903. He is a member of the Hot-Pot Committee which distributes on Christmas Day each year 10,000 hot-pots, feeding 100,000 people. Mr. Hidden expresses himself as fond of all outdoor sports, particularly yachting and golf.

In his dealings with the staff Mr. Hidden unites firmness with a large amount of personal sympathy with all grades. He is particularly fortunate in securing support and assistance from his wife, a native of the Channel Islands, who is well-known and very popular when among the Liverpool staff as she is at times of recreation and occasional social functions.

When a proposal to start a benevolent society in the Liverpool and Birkenhead district was mooted no one worked more enthusiastically on the project or helped more to make it the complete success that it is than the subject of these notes.

Having now been Manager for the Liverpool district for over ten years Mr. Hidden has become a very familiar figure in the business community of the great Mersey seaport, and has a wide circle of friends both in Liverpool and across the Mersey over the Wirral peninsula where he resides.

CHESTER NEW CENTRAL BATTERY EXCHANGE.

By S. H. Pook, *Engineer-in-Chief's Department.*

On Sept. 4, 1909, at 2.30 p.m. the new central battery equipment for 960 direct exchange lines at Chester was successfully brought into use. The city was formerly served by a magneto switchboard and overhead earth circuit line plant. The line plant has now been replaced by an underground metallic circuit system which was brought into use some weeks before the change-over of the equipment. It is now nearly 28 years ago since the telephone system was introduced into the city, and the *Chester Guardian* in its issue of April 15, 1882, comments upon the inauguration of the new service as follows:—

"The Lancashire and Cheshire Telephonic Exchange Company, Limited, have opened an exchange in Chester. . . . The advantages to be derived by members joining a telephonic exchange

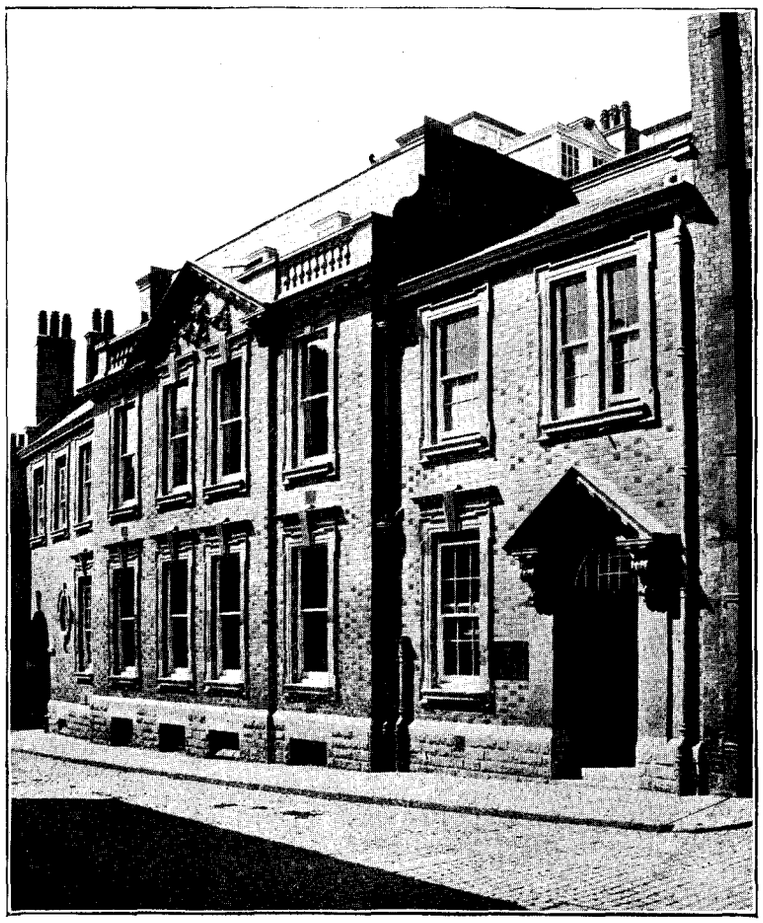


FIG 3.

are numerous. A member of the exchange rings an electric bell connected with the operator, and on being answered from the central office he states his wish to communicate with another subscriber and is at once connected with the wire of the person with whom he wishes to converse. . . . Private wires are found of the greatest utility in connecting shops, warehouses, etc., etc. The exchange for Chester is at the offices of Mr. W. E. Brown, 3, Newgate Street, where information can be obtained and the system seen in working order."

The first switchboard was made by the Edison Company, and is shown on Fig. 1. This board presents a very striking contrast when compared with new central battery board shown on Fig. 2.

The new exchange is situated in a new fireproof building (which is especially designed for telephone purposes) in St. John Street. It was built by Messrs. William Vernon & Son, of 67, Upper Northgate Street, Chester, the architects being Messrs. Bromley & Watkins, of Prudential Buildings, Nottingham. It is quite near the famous old Roman wall; in fact, the Company's premises extend backwards to the Wolf Tower, and the earth plate is buried in the old fosse. When excavating for the foundations of the building the workmen discovered a portion of the original Roman wall. The Company has, by raising the floor at the rear of the general offices, provided a small chamber under the offices in which part of the exposed portion of the wall is preserved. It has also given permission for the public to enter the yard, and descend to this chamber to view the wall, a privilege which is much appreciated, judging by the interest taken in this small

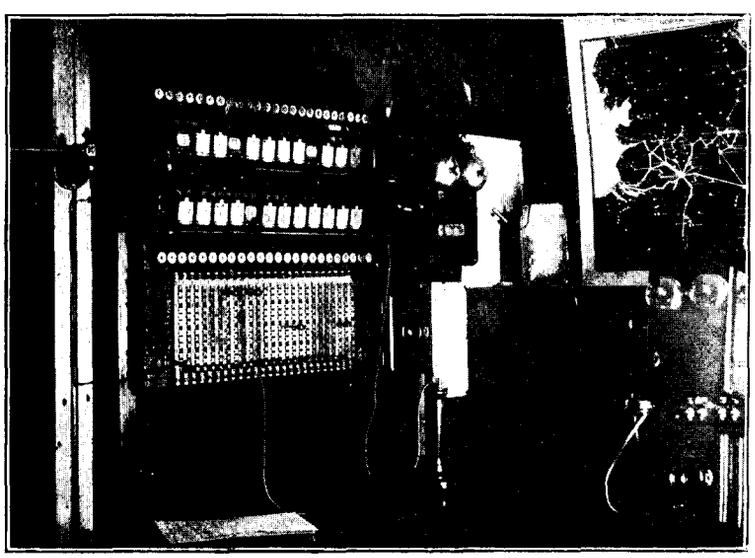


Photo by E. H. Davies, Chester.] FIG. 1.

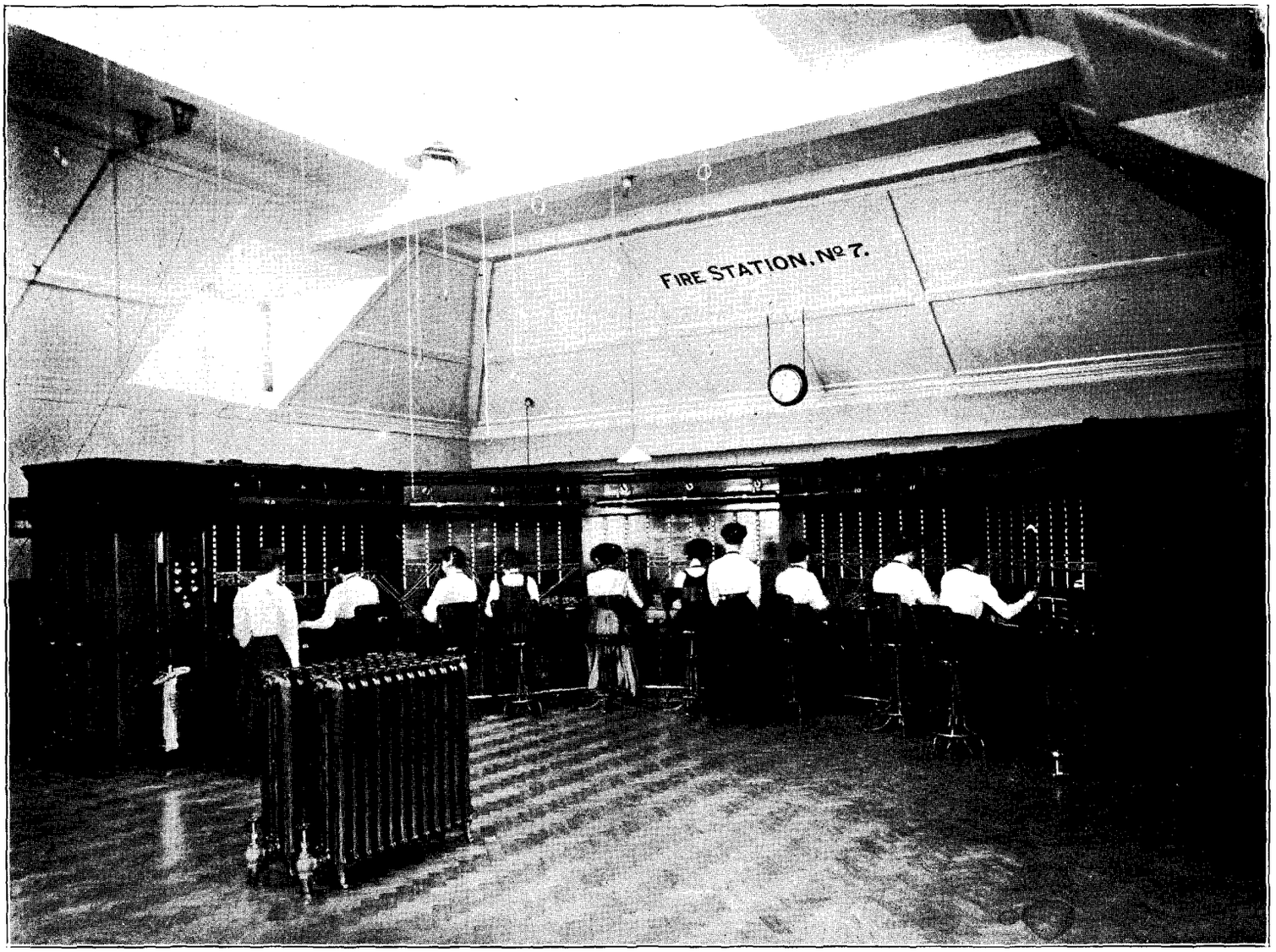


FIG 2.

portion of the wall by antiquarians and others when visiting Chester. A description of this wall, with photographs, and also an account of other interesting discoveries made by the workmen is given by Mr. T. A. Bates in the JOURNAL of February, 1909.

A photograph of the front of the building is shown on Fig. 3. The bricks used in the elevation are Ruabon best red facing bricks, the dressing consisting of Darley Dale stone and terra-cotta.

The general arrangement of the building is as follows :—

Basement.—Stores, instrument inspector's room, strong room, and lavatories for the male staff.

Ground Floor.—General offices for the Chester and North Wales district.

First Floor.—Apparatus and battery rooms and operators' quarters.

Second Floor.—Switchroom.

The arrangement of the first and second floors with the lay-out of apparatus is shown on Figs. 4 and 5.

Fig. 6 gives a general idea of the apparatus room, showing the frames, power plant, etc., and Fig. 2 is a view of the switch-room. It will be seen from these two views that the apparatus and its general lay-out follow closely the standard lines of design for No. 1 central battery equipments, which is now becoming so marked throughout the country.

The underground lead-covered cables are brought into the exchange from the manhole in the street in the Company's standard manner, excepting that there is no cable pit in the basement. This necessitates a special arrangement for protecting the cables and results in a saving of space in the building.

After leaving the manhole the cables enter the exchange in fireclay ducts arranged one above the other along the south wall of the basement, where they terminate under the vertical ducts which convey them directly to the cable trench at the rear of the main frame.

In this trench the cables are jointed to the silk and cotton lead-covered cables, which are then connected to the fuses and protectors on the vertical side of the frame.

The cables are protected in the basement by means of removable teak panels. The arrangement of the ducts and panels is shown on Fig. 7. The drawing shows two of the teak panels removed in order to illustrate more clearly the method which has been adopted.

After leaving the main frame the lines pass through the intermediate frame to the switchboard, being wired in accordance with the standard circuits throughout.

The equipment was manufactured by the Western Electric Company of North Woolwich, and some of the more important figures relating to its capacity and present equipment are given below.

Main Frame—Vertical side.—Thirteen uprights, each with capacity for 200 lines.

Horizontal side—Eight shelves, each with capacity for 240 lines.

Intermediate Frame.—Vertical side—Thirteen uprights, each with capacity for 260 lines.

Horizontal side—Twelve shelves, each with capacity for 240 lines.

Relay Rack.—Capacity for 1,200 line and cut-off relays and also for miscellaneous material in connection with the long, and bothway, junction equipments.

Register Rack.—Capacity for 2,440 registers.

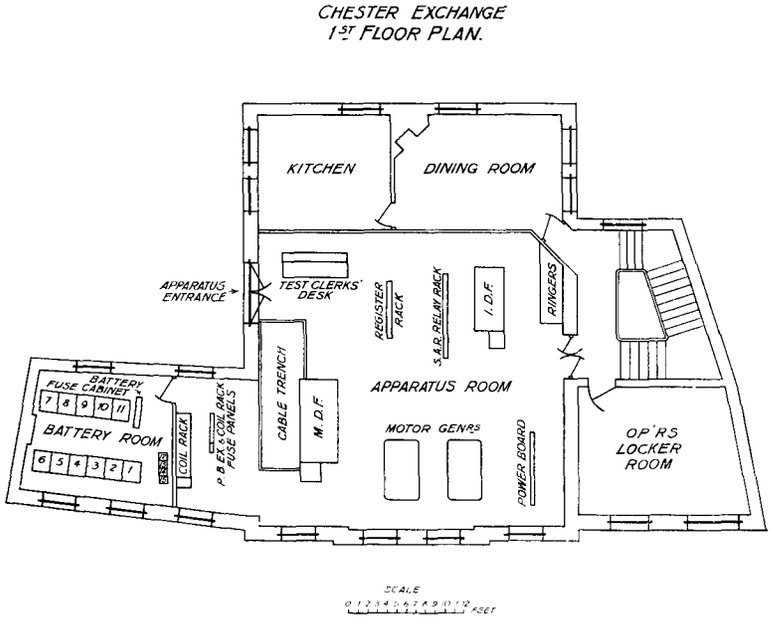


FIG. 4.

Switchboards—These are of the "low" or "6,000-line" type, and are equipped as follows:—

960 direct exchange lines.
9 "A" positions.
3 "B" ,,
1 testing position.
320 answering equipments per three-position section.
27 junctions per "B" position.

Working Subscribers' Lines at Opening.—670.

Charging Machines.—Motors.—11½ horse-power, 420-volt direct current.

Dynamos.—225 amperes at 30 volts.

Ringing Machines.—One motor generator and one dynamotor. Output 75 watts each.

Cells.—Eleven-cell battery, 1,020 ampere hours for a nine-hour discharge.

Four-cell battery, 300 ampere hours for a nine-hour discharge.

The batteries were supplied by the Chloride Electrical Storage Company, and as only one electrical supply is available, they have a sufficiently large capacity to serve the exchange for two days at the end of the period for which the equipment is installed, in order to minimise the risk of cutting off the telephone service in the event of a breakdown on the electrical power supply.

The operating staff is under the control of the clerk-in-charge who, in addition, has the monitorial work of the exchange to carry out, as the present equipment of lines does not provide sufficient work to justify fitting a special monitors' desk.

The method of changing over was similar to that employed in most of our recent exchanges as far as the equipment was concerned, *i.e.*, the new equipment was isolated from the line plant by

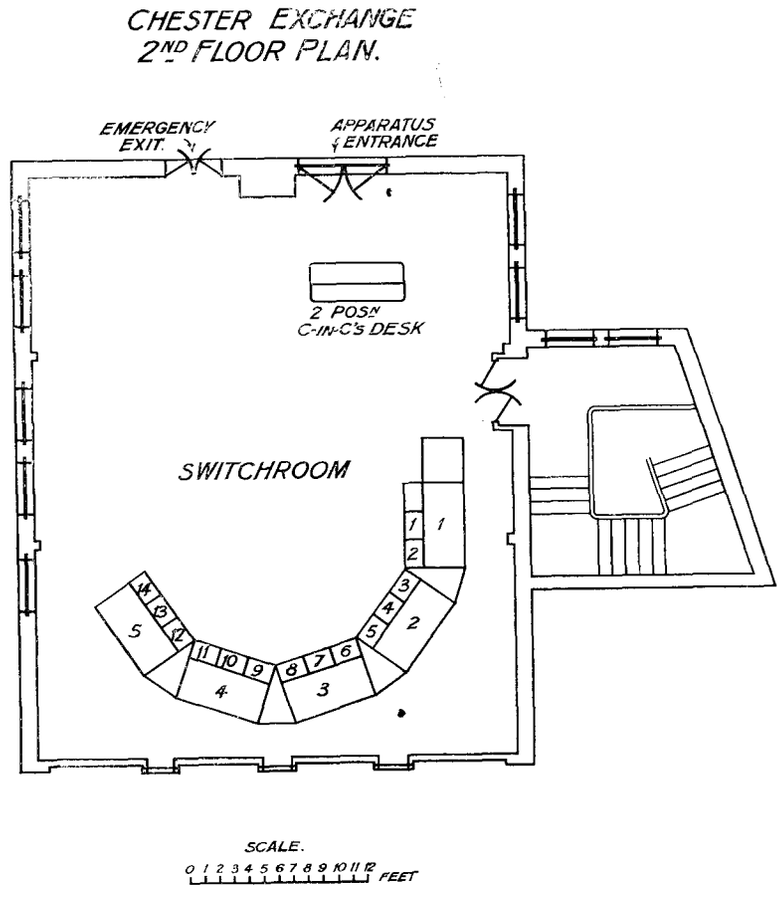


FIG. 5.

wooden wedges in the cut-off relays, which wedges were removed to bring it into use.

Although the old line system was single circuit, the old switchboard was a metallic circuit board and was wired for a metallic circuit system as far as the testboard, where one side of every line

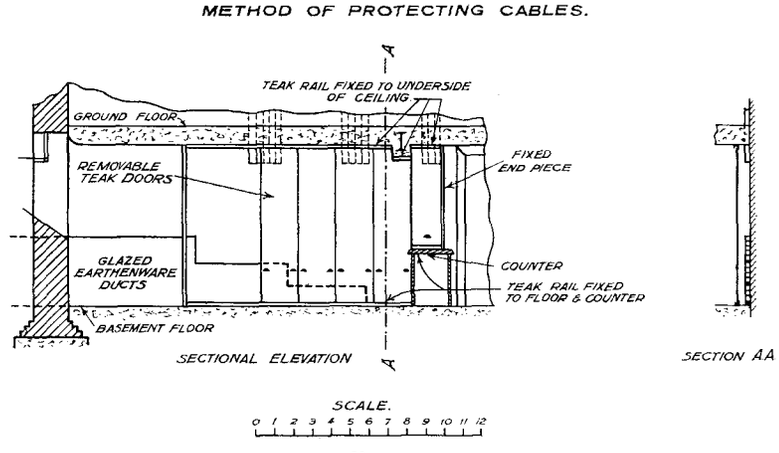


FIG. 7.

was earthed to enable it to work in conjunction with the outside plant.

The subscribers' instruments, which, with the exception of a few cases, have not been changed, were connected to the new underground system and the cables connected to the old testboard, thus

making a metallic circuit magneto system some weeks before the new central battery equipment was brought into use.

In order to diminish the number of temporary cables between the old and the new exchanges, a similar arrangement to that employed at the transfers of some of our recent exchanges was employed. By this method the same lines between the two exchanges are used to take subscribers from one direction to the old exchange before the transfer as are used to bring subscribers from the opposite direction to the new exchange after the transfer.

A description of the method employed showing the circuit through the old testboard, and the new main frame, was given in connection with the transfer of the Deptford equipment in the JOURNAL for November, 1909.

There are no special features in either the apparatus or the circuits which call for any comment, all being similar to those installed in the more recent central battery exchanges which have been described from time to time in the JOURNAL.

The system has been working quite satisfactorily since the opening, and it is hoped that the inhabitants of, and visitors to, the ancient city of Chester will benefit as much by the introduction of the most up-to-date telephone system as it is intended they should, and that they will consider the exchange, which can be seen quite easily from the city wall, near the Wolf Tower, is sufficiently useful to justify its erection amid such historic surroundings.

LONDON AND ITS ORGANISATION.

BY J. STIRLING, *Metropolitan Chief Accountant*, AND J. M. SHACKLETON, *Metropolitan Engineer.*

(*Concluded from page 206.*)

THE number of assistant engineers and wayleave officers in the several local areas varies according to the number of gangs and nature of work on hand. For example, the preparatory labours in connection with an exchange change-over would naturally necessitate extra supervision, and staff would consequently be drafted from a neighbourhood where work was slacker or less urgent. In the City areas, where, owing to density of lines, the local administration is confined within narrow limits, the local and assistant engineers must obtain their own wayleaves; this rule also applies in those other localities where the number of new orders dealt with is small. During the last eighteen months or so, special measures have been adopted for co-operating with the Contract Department in the using up of spare wires. For this purpose a set of cards, showing the spare circuits available at each department, is kept, the figures being revised monthly. The contract agents are thus able to concentrate men on the points where orders can be joined up most economically and expeditiously.

Two dangers to be guarded against in the organisation are (1)

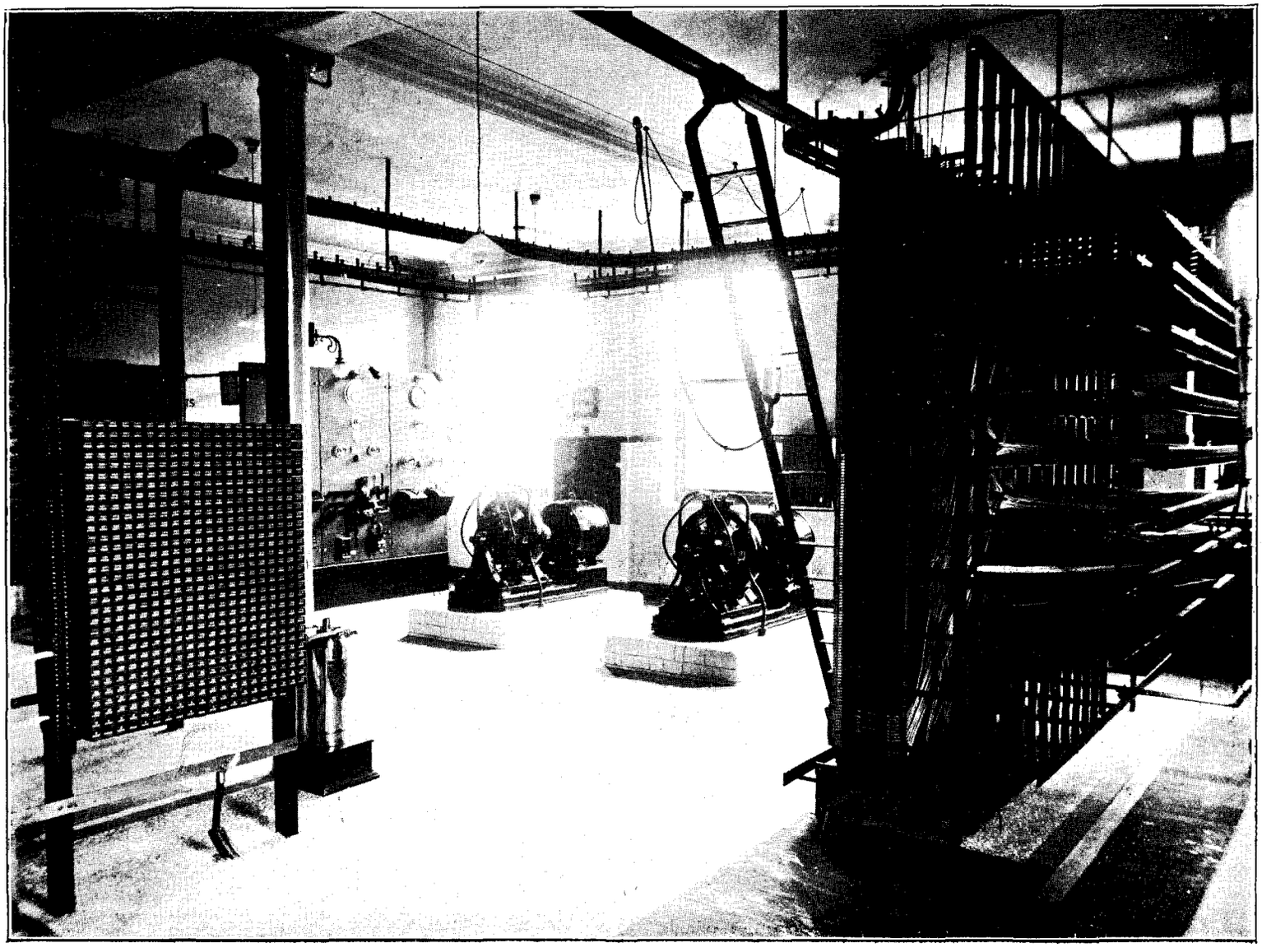


FIG. 6.

making the divisional engineer and his office a mere go-between for service matters affecting the local engineers, and (2) lengthy reports and correspondence between divisional and local offices. To avoid the circumlocution office methods of the first, all routine matters, questions not affecting discipline or policy, requests for explanation

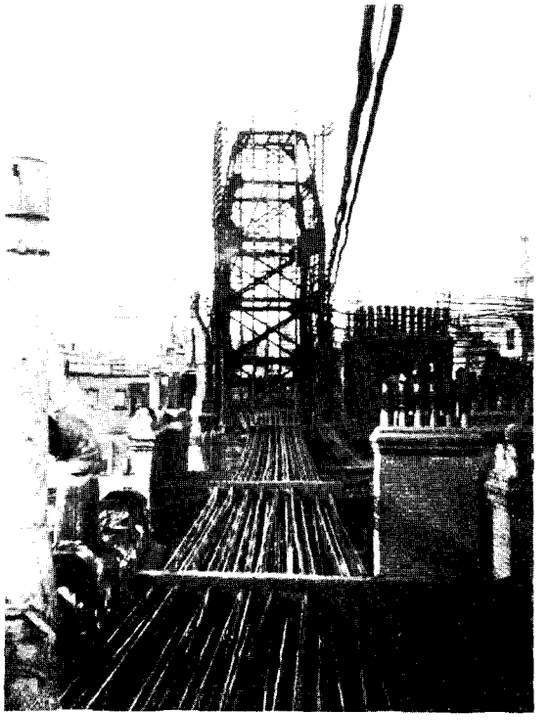


FIG. 3.—LONDON: BANK EXCHANGE DERRICK.

of overspent estimates, etc., are sent from the central office to the local engineer direct, and are only referred to his superior officer if further action is afterwards deemed necessary. The second evil is very insidious, and, like some forms of weed, grows rapidly if unchecked. Frequent visits of the divisional engineer to his local officers, and a liberal use of the telephone, are two good antidotes.

FIG. 4.—LONDON: CLERKENWELL, RENEWING CABLE SUSPENDERS AND SLINGS.

The effectiveness of paper as a personal safeguard against future trouble has much narrower limits than most people allow.

Nothing is easier than to collect a crowd in London. The reason is not always so attractive or fascinating as the one shown in Fig. 4. An element of danger—particularly to other people—always adds zest to a spectacle. Human nature loves to be thrilled, especially without expense, and as the sight of a man in an uncomfortable chair fastened to steel wires suspended 80 or 90 feet above a wood-paved causeway provides both elements, gazers are never lacking. They gaze on and on, not expecting, certainly not hoping that, but rather wondering if, something will happen; as a matter of fact, it never does and is not likely to. At a riverside town, where cable-sling renewing was a novelty, some of the remarks made by the watchers below were entertaining, if not

FIG. 5.—LONDON: COPTHALL AVENUE JUNCTION BOX.

enlightening. "That's our new overhead tramway" was the first piece of sapience; it was followed by "something to do with a flying machine." Why someone did not suggest that it was a new method of Suffragette agitation is unknown; the puzzle was ultimately solved by some schoolboys, who fired off encouraging remarks at the pitch of their voices A tube lift attendant, asked if his occupation was not detrimental to his health, replied, "Well,

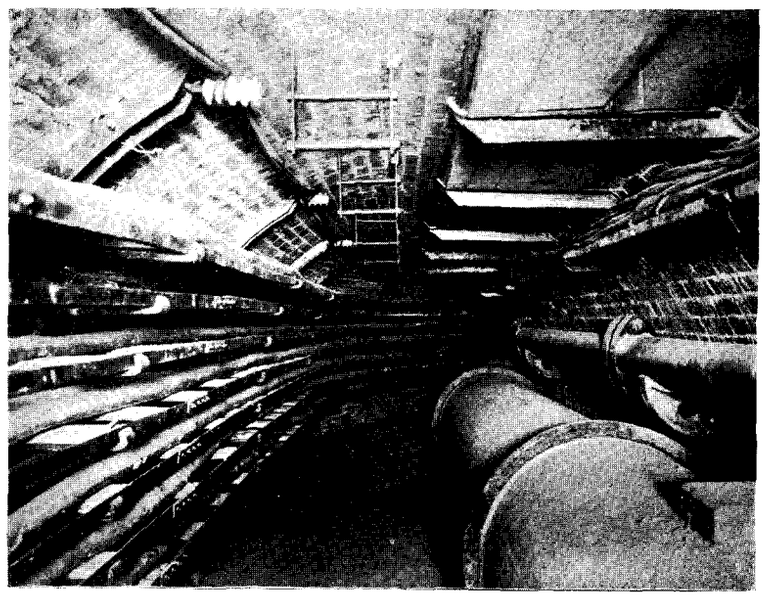


FIG. 6.—SUBWAY, QUEEN VICTORIA STREET, LONDON.

sir, it's very lowering." Our wiremen might fittingly answer the same question with "No, sir, it's very elevating."

The majority of the aerial cables now in use are required for distributing purposes from the underground mains. In certain respects they have advantages over underground branches. An important feature of this aerial distribution in London is its flexibility, secured by the introduction of junction boxes (Fig. 5)

situated at convenient points. Some 500 of these exist in the City alone; from them the distribution is governed, and by their means rapid connections, changes and alterations are rendered possible.

One feature of underground work which has become very pronounced within the last few years is the extent to which cables can now be laid in congested neighbourhoods without extensive trenching. Underground railways, tubes and subways have come to the rescue, and enabled considerable sections of cable to be put down with no disturbance of street traffic, and considerably less trouble than prevailed formerly. Telephones therefore not only have a part in the visible world above, but also in the underworld invisible to the man in the street. The scientific needs of a great city have called these subterranean agencies into being; science created them, and they in turn help their creator in her beneficent work. Fig. 6 gives us a peep into a typical subway under the control of the London County Council. The photograph is taken from a point at the junction of Victoria Embankment and Blackfriars Bridge, where an expansive street improvement has just been carried out. All manner of mains—gas, hydraulic, electric light, telegraph and telephone—may be discerned in position. These subways have proved an immense boon, and will do much to solve the "main" problems of the future.

During 1909, 60,000 works orders were issued in London. As engineers' work is necessary on about 47 per cent. of these, thus involving line plant alterations or additions, some idea can be obtained of the responsibilities devolving on the engineering officers, and the amount of work which they are called upon to deal with.

The average number of new lines completed throughout the last year was 200 per week. As can be understood, the rate at which orders are obtained by the Contract Department is not uniform. The charts show a drop beginning about May, and continuing until August; then the curve line starts rising, and mounts fairly steadily up to the end of the year. This "slack season" in the middle of the year is very marked. Until 1909 it had been the custom, as the orders fell off, to dispense with a number of hands, and re-engage them when things got busy. A somewhat novel experiment has recently been tried, with the object of overcoming this unsatisfactory state of affairs. With the aid of the contract manager, a curve was plotted showing the probable new lines from week to week during the year. Certain known reconstruction works, which in the ordinary way would be spread over the year, were allowed for in the slack season so that the gap might be filled up, and the number of hands throughout the year thus kept practically constant. Head Office consent was obtained, the scheme has now had a fair trial, and has certainly justified itself, for not a single gang had to be paid off during the summer owing to the reduced number of new orders. Incidentally it has also shown that estimates can be adhered to if the requisite care and thought are devoted to their preparation.

Such an arrangement may not be possible in other lines of business, and, even in our own, only the large towns would probably be able to work it in an effective manner. Where it can be done without financial or administrative dislocation, some system of the kind seems eminently desirable as a partial relief to the sporadic outbreaks of unemployment which harass the country.

We have to-day a better type of men on our line-staff than was the case fifteen or twenty years ago. Like men in all other employments, they want to get on. We have lost, without regret, the kind of labourer who, when told that he was to be promoted to wireman, replied "What! To go up them poles and work among them wires? Not me!" His uselessness was scarcely compensated for by his originality. Nothing encourages a man more than the certainty of steady employment; nothing discourages him so much as the prospect of being suddenly turned adrift through lack of work. Regularity of employment, therefore, will be good for both master and man; it will mean better results to the former as the reward for consideration given to the latter. "The man on the job" counts everywhere and always. In telephone economics he counts for more than is frequently allowed; his reliability, his methods, his results are so often the measure of the dividing line between waste and economy.

DEVELOPMENT STUDY.

By W. F. TAYLOR, *Contract Manager, London.*

STUDIES to provide estimates of the number of subscribers likely to be obtained in any given area in a certain time are now being dealt with daily. It will be appreciated that these are of vast importance to the Company. Too small an estimate of the number of probable subscribers in an area may result in a scheme for the supply of telephonic facilities to that area being dropped. On the other hand, too high an estimate means too much plant laid down and a corresponding loss to the Company.

Can we make any definite rules to enable us to strike a happy mean?

Who should undertake the study?

What form should the study take?

How are we to know whether the required number of subscribers is being obtained or not?

These are a few of the queries which occur to one, and I thought I might air, with all humility, my ideas on the subject generally, without digging too deeply into it, or considering it mathematically or microscopically.

Perhaps it may be of interest if I try to answer these questions and embody my ideas and also give some details of what is being done in London to solve some of the problems.

I must confess that I "hae ma doots," as they say in Scotland, if rules are of any great value in regulating the estimated number of subscribers by a given time. Conditions vary to such an extent that it appears to me to be impossible to lay down unalterable laws like those of the Medes and Persians to deal with such cases. Taking a town, city, or district as a whole, I believe it possible to get a fairly close shot by simply projecting past growth of subscribers' lines forward geometrically over the period required, because a section of the district which is going down for some reason or other is counterbalanced by one which is booming, and so on. But such study, while of much interest, and having some use, does not provide the engineers with sufficient details to lay down a plant scheme.

What is necessary is a plan showing the approximate positions of future subscribers. The scale of fineness to which this is done appears to depend to a great extent upon, to misquote Sam Weller: "the taste and fancy of the doer" at the present time; anything from a quarter of a square mile to a 64th of a square mile having been experimented with. The latter is infinitely superior, but the extra amount of labour it requires, especially in towns, has to be experienced to be appreciated.

Take a section having, say, an area of a 64th of a square mile, is it possible to apply a general rule to that area? In other words, can you sit in your office and make development studies at your leisure? Well, there may be some very clever people who are able to do it, but I should like to compare their estimated figures with the actual figures at the end of the period, as I am of the decided opinion that it is not possible, for you will find yourself in the position of a certain telephone administration on the other side of the Atlantic, which made a development study for ten years ahead, laid down the plant and found it all used up in two years. Or you can easily go to the other extreme and lay down plant which would never be used in your day or generation.

To make a correct study of any restricted area it is essential that it be dealt with on the spot by a competent officer, who must be a shrewd prophet of future possibilities. Local knowledge is indispensable; if it does not exist it must be acquired. House and estate agents must be consulted as to the possibility of vacant plots of land, and they often supply most valuable information as to the general trend of any district, whether it is in an upward grade or going down, and so on.

The importance of careful investigation was very clearly brought to my notice a short time ago. I walked round a certain residential district with one of the London divisional contract agents to see for myself the possibilities. On the surface I should have said that it represented an ultimate development of about 60 per cent., but on enquiry it was found that the property was going down, and that large houses which had the appearance of

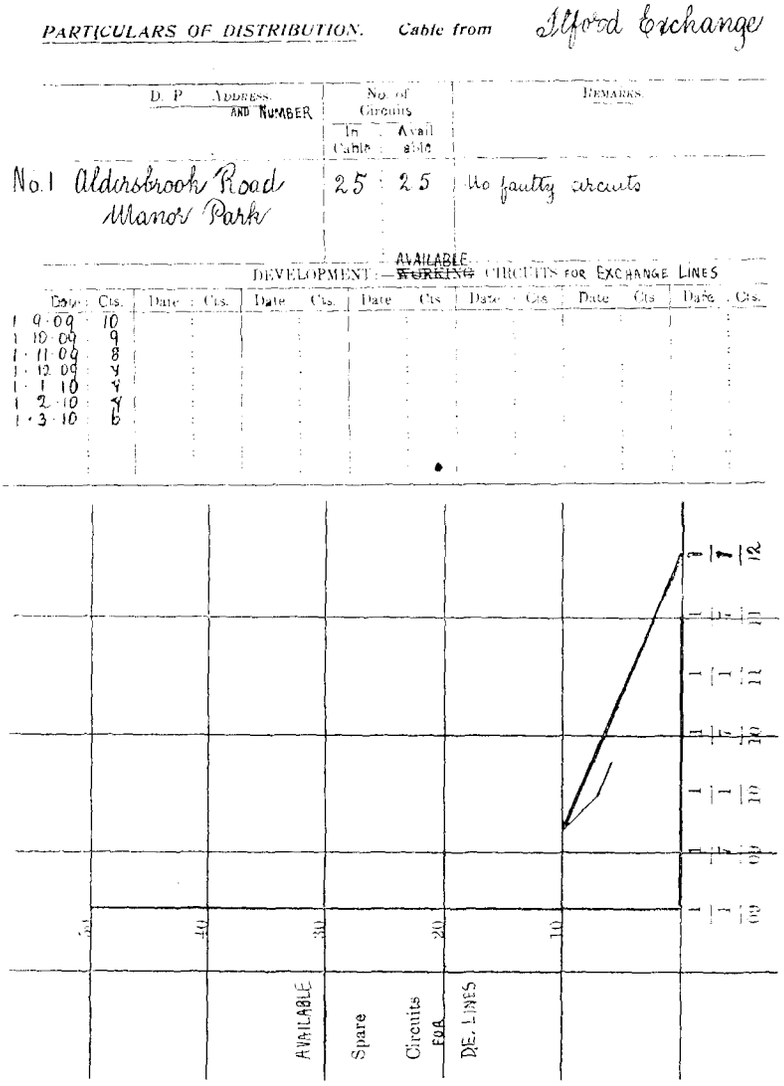
single-tenant houses were actually let out in flats, and in many cases were not worth powder and shot. A general rule applied to that area without investigation would have missed the target altogether.

One can, of course, frame rules for all kinds and conditions of areas, but they would be more bother than they were worth, and I am convinced that only careful block-by-block and practically house-by-house study is of the slightest use if a good shot is necessary, and in view of the importance from a financial point of view of getting as close a figure as possible, it is well worth the extra trouble involved.

This brings me to my second query—Who should make the study? In the past studies have been made by officers in the Engineers and Contract Departments, but I think it is now freely admitted that the latter is the proper one to undertake the work. The Contract Department has a special knowledge of the district through its contract officers, who are constantly picking up information, and their reports give a general idea day by day of how the district is shaping. The contract manager or contract agent must also know the possibilities of each area in his district for his own purpose; that is to say, to get full benefit out of his men, and he is therefore in an exceptional position to supply the information. The engineers are apt to arrange the position of possible subscribers where the existing subscribers cluster most thickly, and I have heard of cases where plant has been laid down on this basis, and all the spares are now to be found in the saturated area and the rest of the poor district is starved. I have taken considerable interest in these studies, and to my mind the contract manager, divisional contract agent, or competent officer in the Contract Department should be responsible for the study.

What form should the study take is the next point. A few volumes of the JOURNAL could be filled with thoughts on this subject, but as I am not a believer in the "continued in our next" sort of article, as one always wanders oneself in trying to remember all the points that went before, I will condense my thoughts on this subject as much as possible. Take as an example a small plot of a district where the spare plant is coming to an end, and where new subscribers are probable, necessitating the provision at an early date of more plant. The first thing in such a case would be for the engineers to provide the Contract Department with a map of the area to be studied, and in order to be thoroughly satisfactory the map ought to have the position of each existing subscriber plotted on it, for if we do not know what exists it greatly increases the difficulty of gauging the number of possible subscribers. It should, of course, be divided up into fractions of a square mile, these fractions being of whatever size may have been determined. Armed with this map the officer appointed to undertake the survey should in the first instance question the contract officers who work the district, as they often have most valuable information as to future prospects which the surveying officer, at any rate in a large district, cannot have. Too much reliance cannot be placed on any figures of possible subscribers that they may give however, for while their intentions are the best, they cannot look at the question with an altogether impartial eye. A good day on the day previous to their being asked the question will send the figures soaring up sky high, where a bad day and many refusals the previous day will send the figures down into the depths. Unsuccessful interview cards for the district should also be consulted, and the general trend of public opinion gained from the reports of interviews summarised thereon. The next step is a visit to the district and a careful survey of existing conditions and future prospects. Is the district going up or down, or is it likely to go up or down in the future? Is there a tramway to be run through the district or a railway station to be opened? Are there any plots of vacant land, and, if so, what is to be built on them? What are the rents of the houses and positions of the inhabitants? And so on. These represent some of the questions to which a surveying officer must find satisfactory answers. Having sized up the district generally, he must square by square go over his map and plot in the number of subscribers he considers possible by the date given. Common sense, patience and a good knowledge of the telephone business, combined with not a little imagination, are absolute essentials to a successful survey officer. The estimating of probable subscribers by a given time, maybe ten, fifteen or twenty years ahead, is not an easy one, or one to be lightly entered upon, and I think it will be generally admitted that it is hopeless to give satisfactory figures without leaving the office chair. Only in one or two cases is this possible. One is where there is a marsh or something never likely to be developed, and another is in high-class residential property, which is well known to the officer responsible for the figure. It is possible to fix in one's mind a percentage of telephones to the total houses in a district of this kind, and then it is a simple matter to count up your houses and apply your percentage. This is not a method to be recommended, and it can only be done where the one dealing with the case has a very great experience of the district.

The figure having been obtained and plotted in the proper squares, the plans should be returned to the engineers, who would then see if the scheme would prove remunerative. It must be borne in mind that all such figures are subject to two things—viz., that the scheme is gone on with within a reasonable time and not


PARTICULARS OF DISTRIBUTION. Cable from Ilford Exchange

D. P. Address and Number	No. of Circuits In Cable	No. of Circuits Available	Remarks
No. 1 Aldersbrook Road Manor Park	25	25	No faulty circuits

DEVELOPMENT—~~WORKING~~ AVAILABLE CIRCUITS FOR EXCHANGE LINES

Date	Cts.	Date	Cts.	Date	Cts.	Date	Cts.	Date	Cts.	Date	Cts.
9·09	10										
10·09	9										
11·09	8										
12·09	4										
1·10	4										
2·10	4										
3·10	6										

left for the last year or so of the period estimated for. Secondly, that sufficient contract officers are provided to cover satisfactorily the district—within reason, of course. Shut off the supply of contract officers and all your fine estimates are not worth the paper they are written upon. It is not sufficient to leave the contract officers at their present numbers, but they must be increased progressively. As our system grows the "dead" charges borne by the Contract Department grow also, such as ceasements, removals, change of name, etc., which divert energy hitherto spent in getting new business into other channels, and unless the energy devoted to getting new business is kept up and strengthened not only will your estimates prove fallacious but your business generally will go back.

We now come to the final problem. How are we to know if a required number of subscribers is being obtained or not? In London we have adopted a card system which shows at a glance how matters stand. I show here both the front and the back of a

card. It really explains itself, but I will just roughly run over the idea. The Contract Department supply the engineers with probable subscribers, the scheme is passed and the work is about to be done. The engineer fills up one of the cards for each distributing pole, giving the number of the available spares to the exchange, and on the back a curve is plotted showing how these spares must be used up month by month, or half-year by half-year, in order to have them completely exhausted by the end of the period estimated for. The card is sent by the engineers to the divisional contract agent, who thereupon sees that every effort is put into the canvass so that the required figure may be attained. This card is returned month by month to the engineer and brought up to date and returned to the divisional contract agent for his information and consideration. The curve on the back of the card thus shows at a glance at any time if the spares are being used up at the proper rate; if they are not then a greater effort is wanted and it may be necessary to transfer a contract officer from a territory where the spares are being used up more speedily than is absolutely necessary, into the more difficult territory until it comes up to its correct proportions. Of course, it may be necessary to engage another contract officer if the other districts are simply holding their own. Every endeavour should be made to get all the spares used up at the earliest possible moment, for in that lies the greatest gain for the company. What I feel is that the divisional contract agent or contract manager, or whoever is the responsible officer, should keep before him as an absolute minimum for each distributing pole area the figure got by dividing the total available spares by the number of months to the end of the period, or, if the period is a long one, quarterly or half-yearly figures should prove satisfactory. He should see that he gets that minimum, and as much more as he can. Where he fails to reach the required figure during any month or half-year, as the case may be, it of course means so much more to be done during the remainder of the period, and this allowing things to fall behind is to be avoided like the plague in this connection as in all others. I may say, and I think it is an important point, that we have a card similar to the one mentioned above, but of a different colour, for every distributing pole in London, either new or old, showing the available spares. This is dealt with as explained, and is kept by the Contract Department as a guide for the amount of new orders required at each point. A map is also provided, and shows the number and position of each distributing pole, so that the Contract Department has no difficulty in knowing the area it serves.

The subject of development is a very fascinating one, and one which must be of special interest to many members of the staff throughout the country. In the hope that it may stimulate interest I submit this little article, and I trust at the same time it may be the cause of some expression of opinion by other members of the staff who have perhaps made a closer study of the subject than I have, and are more qualified to speak thereon.

TELEPHONE WOMEN.

LVII.—ALICE RUTH MARTIN.

ALTHOUGH the Eastbourne Exchange cannot be called one of the large exchanges of the country, it is of sufficient importance to require the care of a capable clerk-in-charge, and this it is fortunate in possessing in Miss Martin, who entered the Company's service at Christmas, 1894.

Miss Martin was born at Blackboys, Sussex, and educated at Uckfield. When she entered the service the Eastbourne Exchange consisted of one room, which answered the purposes of testroom, office and switchroom, and was approachable only by a long flight of rickety wooden steps at the back of the old premises at Grove Road, Eastbourne. There were then about 80 subscribers, only two of whom had metallic circuits, for which, of course, at that time they had to pay extra. It was quite a novelty to speak to Brighton, and communication with London was not obtainable, there being no trunks connected with Eastbourne.

In 1895 the Company removed its premises to No. 36 in the same road and the subscribers were transferred to a 200-line multiple board. Box transmitters were suspended on the board, so that the operators had to stand at their work.

In 1898 a high multiple magneto 300-line board was fitted in the present switchroom, and since then two similar boards have been added, affording capacity for 1,000 lines, the number of stations now working being over 1,300.

Miss Martin has worked under four district managers, viz., Mr. Cowley. Mr. Madgen, Mr. Taylor and Mr. Moorhouse, the present district manager. She was appointed clerk-in-charge in July last, taking charge of an operating staff of nine.

Miss Martin's chief hobby is gardening, and she is fond of country life generally, having spent the years previous to her entering the Company's service in the occupation of farming. She

ALICE RUTH MARTIN.

is thoroughly interested in the Company's work, watching and helping in the rapid growth of the Company's business.

Miss Martin's uncle—Alderman Mark Martin—was mayor of Eastbourne last year, so that she comes of a family which is widely known and respected in the town. She takes a keen interest in all matters relating to her staff and is always willing to do everything possible to promote their welfare and happiness.

LVIII.—ELIZABETH JEFFREY.

MISS ELIZABETH JEFFREY, Operator-in-Charge of Kirkintilloch Exchange in the Glasgow district, entered the Company's service at the opening of that exchange in the spring of the year 1888, and has seen longer service than any other female member of the Glasgow district staff. The exchange is sixth in point of seniority among the 35 exchanges now comprising the Glasgow district.

The year 1888 is a red letter one in the annals of the district, as the first Glasgow International Exhibition was also held in that year. The opening of an exchange such as Kirkintilloch then was would not be considered of very great moment to-day, but in those days it was otherwise, and Miss Jeffrey has a vivid recollection of the importance of the occasion and of taking duty with a very full sense of the responsibility of her position.

Until May, 1905, Miss Jeffrey was able to overtake the traffic

alone. For some time previous to that, due to the introduction of the party, omnibus and measured rate services and the competition of the Glasgow Corporation Telephone Department, the number of lines and subscribers had been increasing rapidly, and the increased traffic necessitated the granting of assistance, which later had to be extended on account of increased morning, afternoon and evening duties.

When the exchange was opened there were six lines and six subscribers, and the call office charge for three minutes' conversation to Glasgow was 6*d*. The number of lines and subscribers now are respectively 68 and 175, and the call office charge for three minutes' conversation to Glasgow is 2*d*. "It's a puir turnoot for Kirkintilloch," is a local joke much drawn on at Kirkintilloch's expense, but, as regards telephone development, it is clearly contrary to fact.

ELIZABETH JEFFREY

Miss Jeffrey was educated at one of the public schools at Kirkintilloch. Reading, music and walking are her favourite recreations; but being actively engaged in her spare hours in Gospel temperance work as president of the Kinkintilloch "Y" branch of the British Women's Temperance Association she has little time for their enjoyment.

Miss Jeffrey's early aspirations lay in the way of becoming a medical missionary, but family circumstances prevented this, and she has refrained from seeking advancement in position in the Company's service for the same reason. In addition to her duties as day operator, Miss Jeffrey also undertakes the duties of operating caretaker, and it is not too much to say that her long and faithful service as telephone operator has made her *persona grata* with the telephone public of Kirkintilloch.

AUTOMATIC EXCHANGE EQUIPMENT.

BY J. HYDE, *Sheffield*.

(*Concluded from page* 215.)

Fig. 8 shows line switch unit open for clearing faults, etc.

Having now treated of a 100-line exchange, I will proceed to describe the operation of a larger one.

For exchanges of over 100 lines up to 1,000 lines it is necessary to have an additional piece of apparatus which is known as a selector, because it selects a connector on the particular hundred on which the desired subscriber is connected. It is somewhat similar to a connector having ten rows of banks of ten circuits each. Each row represents ten trunk lines to ten connectors, which are fitted on each 100-line switch unit.

The bottom row goes up to ten connectors for subscribers 100 to 199.

The second row goes up to ten connectors for subscribers 200 to 299.

The third row goes up to ten connectors for subscribers 300 to 399 and so on.

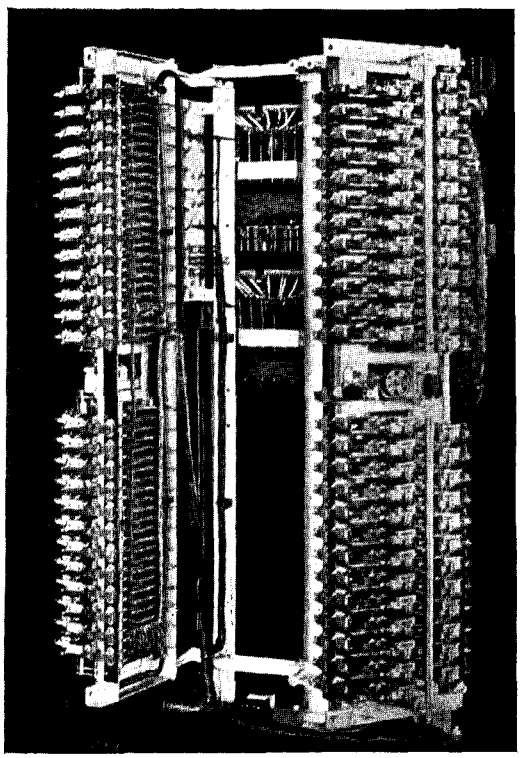
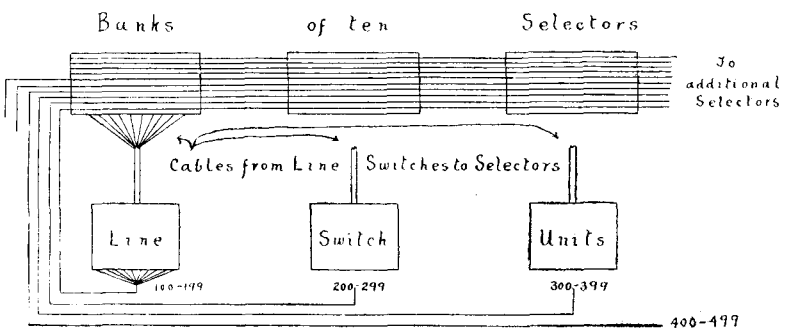


FIG. 8.

To bring into use the selectors the cross-connecting wires are taken off the line switch tags and a cable is run from the multiple tags to the selectors. From each row of ten circuits a cable is brought back and connected on to the tags of the ten connectors corresponding with that particular hundred.

Fig. 9 shows method of cabling selectors and line switch units. From the line switch multiple a cable is taken to its bank of ten selectors.



Cables from Selectors to Connectors

Fig 9

On all selectors from the bottom bank of ten lines a multiple cable is wired from selector to selector, and then run to the ten connectors on the first line switch unit; that is to lines 100 to 199. The same applies to the second bank of ten circuits up to the selectors and so on.

Let us now see how a connection is made on the 1,000-line exchange. Suppose we require 394. Take the receiver off the hook, put the finger into hole 3 and pull round the dial. The dial in going back

earths the vertical line three times, raising the wipers on the selector to the third row of trunk lines, which terminate on the 300 to 399 bank of ten connectors. The earth on the rotary line moves the compound switching key to its second position. This completes the rotary magnet circuit, causing the wipers to rotate over the trunk lines automatically until they come to a trunk leading to a disengaged connector. At this point the compound switching key moves into the third position, which now puts the circuit through to the connector selected. The finger is now put into hole 9, the dial brought round to the stop and released. The connector wipers are now raised to the ninth row of lines, the compound switching key moving into the second position. The finger is now put into hole 4, the dial brought to the stop and released. The connector wipers now rotate along to the fourth line, the compound switching key moving into the third position, which is the through position We now press the ringing key, which operates the generator relay, and so get connected to our subscriber.

Exchanges over 1,000 lines up to 10,000 lines have first and second selectors fitted, the first selector selects a second selector in 1,000 group required, the second selector selects a connector on a 100-group of subscribers required.

Fig. 10 is a diagram of selector connections, the actions of which have already been described.

It will be remembered that in describing the first connection I said that by pressing the ringing key the par icular ringing required for that subscriber was put on his line. Party line working can be adopted on the automatic system. Each subscriber on the line has a different number differing by 100, thus—3,274, 3374, 3474 and 3,574. By this means we have each subscriber terminating on a different bank of connectors, and by adopting four different methods of ringing we can ring one subscriber on the line without disturbing the other three subscribers.

Private Branch Exchanges.—The subscriber has only one number, as upon the manual system. His lines terminate on a special set of connectors, so that if the first line is engaged the wipers automatically rotate till they come to the first disengaged junction line.

Call Offices.—In these the caller makes his connection in the usual way and rings. He can hear the subscriber when he answers his telephone, but cannot speak to him till he puts his penny into the automatic box.

Measured Rate Subscribers.—There are two methods adopted. In one method the subscriber has the register fitted at his telephone. He calls in the usual way, but cannot answer till he depresses the register key, by this means recording the call. The other method is to have the register fitted in the exchange which does not operate till the subscriber called answers his telephone.

Dealing now with " a telephone system," we have three main points on which capital has to be expended:

(1) Cost of apparatus, both central office and subscribers' instruments.

(2) Cost of central office, buildings and furnishing.

(3) Cost of overhead wire, underground cable and conduit plant.

In the third item—the overhead wire, underground cable and conduit plant—we find the largest factor of the three. This is a variable quantity, depending upon the average length of line, which is controlled by the density of population and also by the facilities allowed for running cable and wires by the best routes for distribution. Under almost any circumstances this part of the system will cost more than the two other parts combined.

In a large town in which the lines are well distributed the effect of bringing all lines into one central office, whilst obtaining the greatest efficiency from the operators, has on the other hand the effect of making the outside construction very expensive.

As we are all well aware, a subscriber does not use his line from morning right on till night, but only a part of the day. It is evident, then, that a large number of the lines at any time must be lying idle. To get a greater efficiency out of the cable it is necessary to divide up the plant so that instead of one large central office we have a number of small offices, by this means reducing the outside cost.

Just how much saving can be effected in this way depends upon the local conditions in each city, but it will be readily understood that if small central offices are distributed over a city in well-selected districts and the telephones in each district connected only to the local office the subscribers' lines would be decidedly shorter and cheaper than when all were run to a large central office.

The effect of increasing junction calls is to reduce the number of calls which an operator can handle. From this it is evident a busy operator must have the subscribers on her board reduced when a large number of subscribers are connected to sub-exchanges, if the operating efficiency per subscriber's line is to be maintained.

There is also another point which helps to reduce the maximum number of subscribers which an operator can control, viz., the larger the number of subscribers on a telephone area the greater inducement is there for the subscriber to use his telephone.

Increasing the number of exchanges on the manual system reduces speed of service and tends to increase the number of mistakes. There are also more premature disconnections, with increased difficulty in locating the cause.

Increasing the number of offices in an automatic system does not appreciably affect the service. All calls are trunked, whether one office is used or many. Therefore, splitting up such a system does not add to the amount of trunking, or in any way affect the

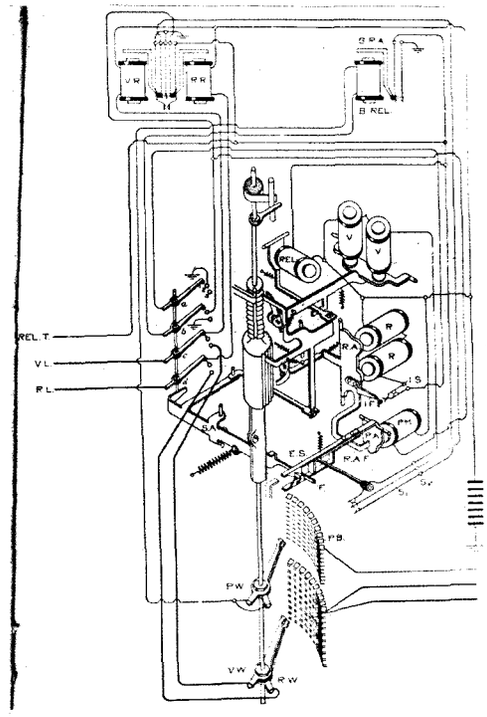


Fig. 10.

speed and uniformity of service. The subscriber is not required to change the method of his calling or to make more turns of his dial. No more automatic switches are necessary, and a connection does not include any more switches in a divided system than in a single office plant.

By referring to Fig. 9 it will be seen that though one line switch unit be taken away to a more convenient building the working is exactly the same. An automatic junction line will carry, on an average, more busy hour calls than a manual junction line. One reason for the increased efficiency of automatic junction lines is found in the shorter length of time per connection.

Makers of automatic systems claim that their subscribers answer more quickly than manual subscribers. We, of course, can hold our own views with regard to that, but must admit that connection and disconnection is made much more quickly on the automatic system.

The interval of time that elapses between release of junction by one automatic selector and seizure of it by another need only be a fraction of a second. This helps to increase the carrying capacity of junctions between exchanges.

The writer is indebted to the Automatic Electric Company of Chicago for permission to reproduce the illustrations which are given.

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CANVASSER AND TRAFFIC MANAGER.

OUR editorial on "The Traffic Manager as Salesman" has called forth some comment from our contemporary the *Zeitschrift für Schwachstromtechnik*, which takes considerable interest in English telephonic affairs. After alluding to Mr. PIKE'S article in the December number and describing the canvasser as a "commercial traveller in telephone connections" it goes on to say:

"A not less interesting appearance is the traffic manager. Whilst the canvasser is selling connections the traffic manager must be selling calls. If under the flat rate, it is to the interest of the administration that the subscriber speaks as little as possible, under the message rate it is naturally to its interest that the subscriber makes as many calls as possible. To this end the traffic manager should help.

"The National Telephone Company, therefore, some time ago installed officials of this description, *whose principal duty, amongst others, is to increase the number of subscribers' conversations.* And yet it is a part of Mr. LAWS WEBB'S favourite arguments that by the message rate unnecessary conversations are discouraged, the cases in which a line is engaged are diminished, and the improvement of the service is assured."

It would seem that our contemporary has fallen into the error of supposing that traffic managers have been appointed specially to increase the sale of calls. As our readers know, these officers have been in existence in the larger exchanges for some years with the primary object of watching carefully the fluctuations of traffic in order that both plant and operating may be adequate in quantity and distribution to deal with it expeditiously. It was their further duty—and this practice has had most successful results in America—to advise the contract office of cases where subscribers habitually overloaded their lines, and to furnish that office with data to convince the subscriber of the advisability of increasing his telephone accommodation.

The aim of our article was obviously to suggest a fresh direction for the traffic manager's energies—namely, that of increasing the usefulness of the telephone to the subscribers. It is admitted that under the measured rate it is to the interest of the administration to increase the rate of calling per line, but under a well-planned tariff this increase is not encouraged beyond a certain maximum above which the subscriber is expected to take another line. But this admission in no way subverts what the *Zeitschrift* calls Mr. WEBB'S darling argument, which is that the flat rate directly encourages frivolous calls, and thus greatly assists in overcrowding lines. On unlimited service lines a vast amount of unnecessary telephoning is done simply because it costs nothing, and calls are made which never would be made if they had to be paid for separately. We recently laid it down in the JOURNAL as an axiom that a call which the subscriber thinks it worth while to pay for is not a frivolous call. Social calls certainly have their place in telephone traffic as much as business calls, but the very sparing use of the service made by a man directly he has to pay for each call is extraordinary. All that we suggested to the Company's traffic managers was that it was their duty to encourage subscribers to make greater use of their lines, believing as we do that telephoning is the most expeditious and satisfactory means of communicating as well as being the most economical. There is a huge difference between taking full advantage of the convenience of the telephone and making frivolous and unnecessary calls because they entail no extra cost to the caller.

EDUCATING THE SUBSCRIBER.

THE education of the subscriber in the complete art of telephoning, which was the subject of an interesting paper read by Mr. R. GREGORY before the traffic branch of the London Telephone Society, frequently occupies the attention of telephonic and electrical periodicals. Although our education begins with the cradle and, except in the case of the self-sufficient, only ends with the grave, it may nevertheless not be diplomatic to talk to a subscriber of "educating" him in the proper method of using his telephone. He will feel assured that he has nothing to learn, and that the art is so simple that instruction is superfluous; but, as we know, it is the sum of small things done well which makes up the total of harmony and smoothness in great public services. A subscriber who habitually speaks with distinctness and who answers his telephone bell with promptitude may add still further to the general efficiency of the service by conforming to a standard practice which, after all, requires to be learned and therefore implies "education."

The education of subscribers is of two kinds. There is the education of the prompt and businesslike subscriber into uniform telephone methods which are of incalculably greater benefit to his service than he would deem possible. Few subscribers, perhaps, realise the part which they themselves play in operating, for although it is readily grasped that delay in answering the telephone is as prejudicial to quick service when it arises at the subscriber's end as when it arises at the exchange, it is not so clearly understood how largely incorrectly enunciated numbers and unnecessary hallos, "are you theres" and other expressions very little to the point bulk "in the chronicle of wasted time."

The education of the minority of unbusinesslike, unreasonable or rude subscribers is, of course, a different matter. It is a slower and more difficult process. The type of man who does not hesitate to keep his correspondent waiting his pleasure at the telephone, or to speak to the operator over the line as he would not dream of speaking to her face to face, will probably resent the idea that he does not know all about telephoning and decline to follow rules "for the convenience of the Company," as he would put it. Even he may with patience be brought to see the value of uniform practice in giving in numbers, in commencing conversations with correspondents, and above all in the prompt answering of calls. Mr. GREGORY gave instances in his paper of troublesome subscribers who, when the matter was tactfully put to them, at once saw the error of their ways, and therein seems to lie the solution of the "educational" difficulty. Once bring the subscriber to realise the benefits which will accrue to his service from adhering closely to the laws of good telephone-using practice and he will willingly follow them. Tact in achieving this result is the key to the problem.

SUPERANNUATION IN THE CIVIL SERVICE.

THE EFFECT OF THE SUPERANNUATION ACT, 1909.

By W. R. BOLD.

AT the time the agreement for the purchase of the Company's plant was entered into by the Postmaster-General and the Company, viz., in 1905, the grant of superannuation allowance to members of the permanent or established Civil Service was regulated in the main by the Superannuation Acts, 1834, 1859 and 1887. To qualify for a pension it was necessary—

(1) That a Civil servant should have been admitted to the service with a certificate from the Civil Service Commissioners, or hold an office specially excepted from this requirement.
(2) That he should have given his whole time to the public service.
(3) That he should draw the emoluments of his office from the public funds exclusively.
(4) That he should have served for not less than ten years.
(5) That if, under the age of 60, he should be certified to be permanently incapable from infirmity of body or mind of discharging his official duties, or have been removed from his office on the ground of his inability to discharge his duties efficiently.
(6) That he should be certified to have served with diligence and fidelity to the satisfaction of the head of his department.

On a Civil servant retiring under the above conditions he was qualified for a pension calculated at the rate of $\frac{1}{60}$th of his retiring salary (or, in certain cases, of his average salary for the last three years) for each complete year of service subject to a maximum of $\frac{40}{60}$ths.

The pension was calculated on the average salary for the last three years in cases where the retiring servant had not been in receipt of his retiring salary *or* in the class from which he retired for a period of at least three years immediately before the grant of the pension.

It was also lawful for the Commissioners to the Treasury to grant to any person, retiring or removed from the public service in consequence of the abolition of his office or for the purpose of facilitating improvements in the organisation of the department to which he belonged, such special annual allowance by way of compensation as on a full consideration of the circumstances of the case might seem to the said Commissioners to be reasonable, but no such allowance could exceed two-thirds of the salary and emoluments of the office.

The female members of the Civil Service were treated the same as the male members, save that on marriage they were called upon to retire. If they had been in the service not less than six years they received a marriage gratuity of one month's pay for each year of service, not exceeding however as a whole one year's pay.

No payment of any kind was made on death except in some cases of death due to injury in the actual discharge of duty.

There were other provisions applicable to persons retiring with less than ten years' service, but these are immaterial for the purpose of this article, seeing that the Postmaster-General has undertaken to treat the staff of the Company as eligible for superannuation allowance notwithstanding the fact that they may not have had ten years' service with the department.

For very many years past strong objection had been taken by a very strong body of the established Civil servants to the above provisions on the ground that "they omit any provision for the serious contingency of the death of a Civil servant during or immediately after his active service." They argued that the pension was deferred pay, so that death during or immediately after active service deprived a Civil servant of that portion of the deferred remuneration which had actually been earned by him.

As a result of continuous agitation, extending over a period of more than ten years, and the report of a Royal Commission appointed in 1902 for the purpose of considering "whether it is possible so to amend the existing system of superannuation of persons in the Civil Service of the State as to confer greater and more uniform advantages upon those to whom it applies without increasing the burden which it imposed on the taxpayer," a Bill to amend the Superannuation Acts, 1834 to 1892, was introduced last Session and became law under the title of "The Superannuation Act, 1909."

This Act, whilst in no way varying the qualifications necessary for a pension alters the system of pension as follows:—

It reduces, as regards male members of the Civil Service, the rate at which the pension is to be calculated from a 60th to an 80th of the retiring salary, or in certain cases (mentioned above), of the average salary for the last three years, but introduces a cash payment on retirement, called an "additional allowance." This additional allowance is calculated at the rate of $\frac{1}{80}$th of the annual salary and emoluments of the office held by the servant in question multiplied by the number of completed years of service, but in no case will such additional allowance exceed one and a half times the amount of such salary or emoluments.

It provides that the legal personal representatives of a male member of the Civil Service entering after the passing of the Act who dies after he has served five years or upwards, and whilst still employed in the service, shall receive a gratuity equal to the annual salary and emoluments of the office of the deceased, and further that if any such Civil servant dies after he has retired and become entitled to a superannuation allowance, his legal personal representative, shall receive such sum, if any, as shall be necessary to make the sums actually received by the deceased on account of superannuation allowance and additional allowance up to the amount of the annual salary and emoluments of the office of the deceased.

The Act also provides that in cases where a Civil servant retires from the service, or dies, after attaining the age of 65 years in the service, there shall be deducted from the amount of the additional allowance and death gratuity payable to him or his legal personal representatives a sum equal to one-twentieth of the amount of the additional allowance or death gratuity, as the case may be, in respect of every completed year he has served after attaining the age of 65.

The Act also abolishes, as regards future Civil servants, the above-mentioned powers of the Commissioners of the Treasury to make a compensation allowance not exceeding two-thirds of the salary and emoluments of the office of a Civil servant whose office is abolished for the purpose of facilitating improvements in the organisation of the department to which he belongs, and substitutes therefor a power for the Treasury to grant in lieu thereof a special allowance, not exceeding, in any case, the amount which a Civil servant would be entitled to or which might be granted to him if he retired on the ground of ill-health.

BLOCK CANVASSING.

By H. ELLIOTT, *Manchester.*

WITH the opening of the new "City" Exchange in Manchester a systematic block canvassing scheme has been inaugurated, and the card index system slightly elaborated to fit in with it. A short description of the scheme will no doubt be interesting to contract men and may be to others who are interested in any scheme of organisation.

A 25-inch scale map shows the "City" divided from the Central as per Fig. 1. The "City" area is divided into six districts A, B, C, D, E and F. Each district is mapped out in blocks (these being at the same time the distributing areas in the Engineers' scheme) numbered A1, A2, A3, etc. In Slater's Directory of Manchester the names of the tenants in the different blocks have been carefully scrutinised, and in red ink a small letter *s* shown

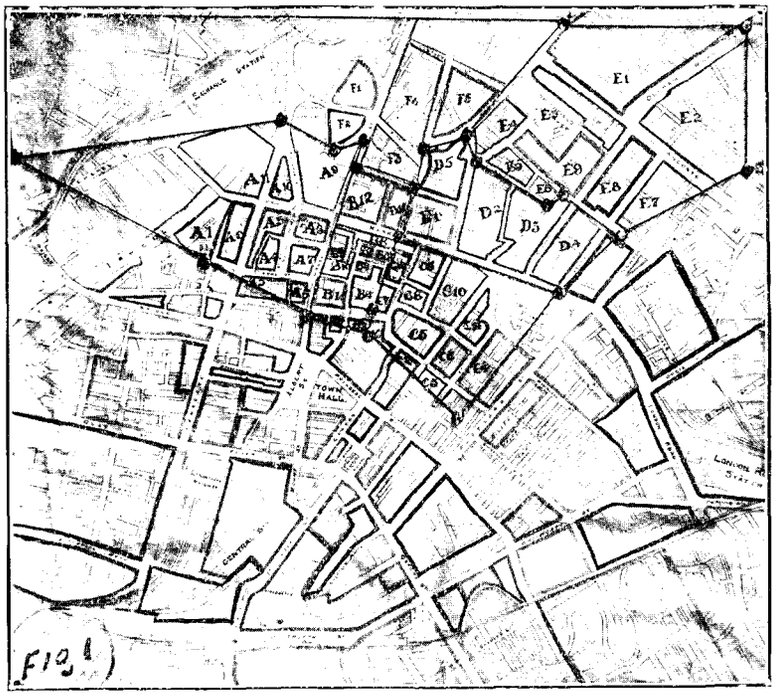


FIG. 1.

against the names of existing subscribers. Senior contract officers well acquainted with the ground went over the names of those left and marked the "probables" with a small letter *p*. The names of these "probables" are posted with the streets and numbers on

CITY. SECTION D. BLOCK 1.

	New Brown St., High St.		Market St., Cannon St.
75	Redfern & Son—*Signed.*	105	Carpenter J.—*Secretary.*
77*a*	Blackburn & McFarlun—*Removed.*	105	City of Manchester Permanent Nursing Society.
79	Levien, Benj.	105	Woods, J. T.
87	Roberts, Robt.—*Signed.*	105	Gidman, H.
93	Sprickley, White & Lewis—*Signed*	105	Boot's Cash Chemists—*Not to call.*
93	Cookson & Macdonald—*Subs.*	105	Waldorf Toilet Salon.
93	Hulmes, Tom.—*Always closed.*	107	Hooper & Co.—*Show room only.*
93	Merchant, Wm.—*Always closed.*	107	Bennett & Co.
93	Ramsbottom & Co.	107	Slater, A.
93	Lyric Theatre Co.	107	Hall, J. H. & Co.
93	Hitchcock, Williams & Co.	107	Clarke, A. H.
93	Savings, Ltd. — *Removed to Harperley.*		

FIG. 2.

specially ruled cards (Fig. 2) which serve the purpose of pilot cards. A senior officer is appointed to take charge of the squad of six contract officers. The contract officers working from the pilot cards systematically take first block No. 1 of each section and work outwards. They are not provided with pocket books but carry "report of interview" slips and write them up in pencil on the spot call by call. In case of "no interview" a slip is made out and an explanation given as to why "no interview." On returning to the office each man writes his unsuccessful interview cards up from his slips, then, securely binding his slips, hands them over to the senior officer.

UNSUCCESSFUL INTERVIEW.

Name....Levien Benj.
Adaress....79, Market Street.
Business....Tailor.
District....City section D. *First call*....14/5/09. *Canvasser*....W. W. Brown.
Summary of interviews.....Saw Mr. Levien; busy with customer; seemed favourable; would let me know, 28/7/09. Mr. L. would not see me, 25/8/09. Will see me later, 2/11/09. Call in a fortnight.

FIG. 3.

The senior officer scrutinises the reports, and having satisfied himself that the work is being properly done cancels the "no interview" slips and hands the batches to the contracts clerk for the purpose of his daily reports. The senior officer is responsible for seeing that the blocks are circularised and canvassed systematically, and that reports are made out and filed in proper order on the card index files. It will thus be seen that we have on the pilot cards in the first place the name of every tenant in each block of the ground under canvass who is considered a "probable" subscriber. Starting with block No. 1 on each district, the ground was swept rapidly on the first attack, and the most likely people secured, "call backs" being left over for the second attack, and divergencies being made only for definite appointments. As the work progresses names on the pilot cards of people who have disappeared, or with whom we need not concern ourselves for various reasons, and of those who are secured as subscribers, are ruled off, and a short remark made as to the reason of the ruling off, leaving on the cards only those who are still probable subscribers. We have then at the back of each pilot card an unsuccessful interview card (Fig. 3) for every "probable," and on these we have the reports as to our non-success up to the present.

The advantages claimed for a systematised canvass such as this are, amongst others, a complete card index of all the probable subscribers on the ground; evidence of all probable subscribers being called upon; and concentration of forces on defined areas which can most readily and economically be served by the engineers.

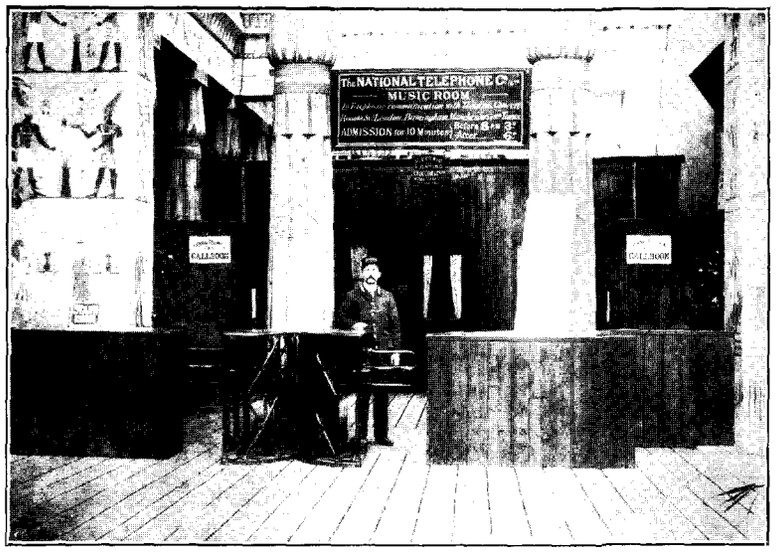
THE EARLY TRANSMISSION OF MUSIC BY TELEPHONE.

By H. DAVIS.

IN Mr. Pratt's able and interesting description of the "Electrophone Working or Music by Telephone," in the JOURNAL of March, 1907, he states that about twelve years previously the Company decided to introduce to its London subscribers performances and transmission of music over its telephone wires. This by no means describes the many efforts of the Company to introduce to the public, and to popularise such use of their lines. To my knowledge this was in vogue over twenty years ago; the first of such entertainments I remember was in a lecture room at Peckham, and was given by Mr. Holt on the Edison chalk receiver. This was followed by many exhibitions in and around London, the method of hearing being by sets of Bell receivers on baize-covered boards, as illustrated.

A very successful entertainment was given at the Public Hall, Croydon, at a bazaar opened by Lady Beatrice Herbert, now the Countess of Pembroke, who was interested in the then considered novel and scientific entertainment; but what may be considered the most successful effort in this direction was in the music room at the Electrical Exhibition at the Crystal Palace, opened on Jan. 10, 1892. The entrance was as shown in the accompanying illustration, from which you will see by the cards that the Company transmitted music over its lines regularly from the Lyric Theatre,

London; also from the Birmingham, Manchester and Liverpool theatres. From the latter place the music and singing of the Carl Rosa Opera Troupe was very well received, and much appreciated. The room was open for a period of 26 weeks, with 57,992 recorded visitors, which shows its popularity, and on many evenings the crush at the turnstile was so great that the police had to be called to our assistance to regulate the traffic. I remember the case of a clergyman who attended each evening to go through the ten-minute turns until he heard the whole of *The Mountebanks*, a case one would think of conscientious scruples, the reverend gentleman probably not



caring to attend the theatre, but pleased to hear the comic opera right through. Many interested visitors expressed their pleasure. Sir Wm. Preece frequently brought visitors to the hearings. Among others were His Grace the Duke of Devonshire and Lord Kelvin.

As an example of its interest as an advertisement, I may quote the instance of a theatre proprietor who, after listening for some time, and the Company's method of installation being explained, and that the Company could transmit the music through to private-house subscribers, informed me that he would be pleased if transmitters could be fitted on the stage of his theatre.

By permission of the Proprietors of "Punch."

The Press comments were very favourable, and you can see from an illustration to an article in *Punch* that the irritable person wears a very worried look owing to the disturbance caused to his hearing by the comments of other visitors.

In the majority of the cases where music was given, in addition to the advertisement and to the successful popularising of the entertainment, the return on the outlay was profitable. It would almost seem as if this method of increasing business for the Company and affording pleasure to its subscribers had not been worked for all its worth.

AN AUTOMANUAL TELEPHONE SYSTEM.

As promised in the January issue of the JOURNAL, we print below an account of the "Clement" automanual system as installed at Ashtabula Harbour, Ohio. For this account we are indebted to the *Electrical World* for Nov. 25, 1909.

The relative simplicity of the so-called "automanual" telephone installation in comparison with a manual equipment will be appreciated when one considers the appearance of a manual operator's switchboard while examining the key bench of the automanual system illustrated in Fig. 1. The bench contains only three simple sets of keys and three sets of lamps.

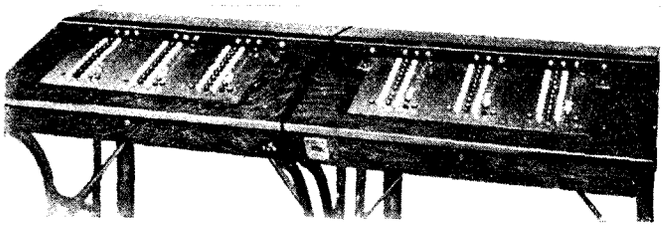


FIG. 1. KEY BENCHES FOR TWO OPERATORS.

The system can best be explained by outlining the operator's duties. An entering call causes the lamp of one set to be lighted; the operator presses her listening key, thereby connecting her headset to the calling line and, having ascertained the number of the subscriber desired, she presses keys corresponding to this number and touches a starting key which releases the relay brought into service by the listening key and starts the calling connection through automatic switches, where it is completed. All conversations between subscribers are absolutely private, it being impossible for two sets of subscribers to be joined to the same circuit, and even the operator cannot overhear the conversation.

The subscriber's equipment consists of telephone apparatus identical with that used with the ordinary common battery system. His metallic circuits enter the exchange building and pass through the usual main frame terminals and protectors to be ended upon the usual line relays and cut-off relays; the local trunks or link circuits between the primary selector and first selector switches are provided with condensers, and sleeve and tip relays bridged on the main battery, so that the circuit conditions are identical with those in standard common battery manual boards. All of the switches and relays are mounted in the usual manner upon iron racks apart from the operating room.

The details of the automanual equipment will be understood from a description of the various operations performed thereby. When a subscriber calls by taking down his receiver, his line relay causes a primary selector switch to connect his line with an idle local trunk or link circuit, and at the same time starts a secondary selector switch which immediately connects the primary trunk and the calling line to an operator's idle key-set. The key-set lamp then lights, thereby indicating a call, the operator presses her listening key as usual, ascertains the number desired, and depresses the corresponding buttons, thereby determining the number of impulses to be sent to the selector and connector

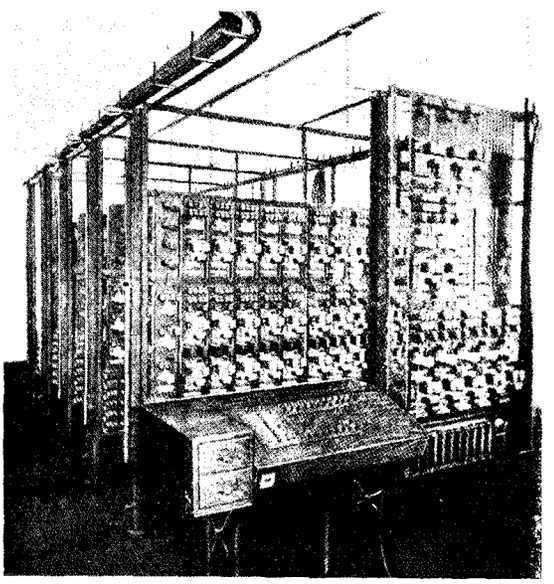


FIG. 2.—WIRE CHIEF'S DESK AND AUTOMANUAL SWITCHING EQUIPMENT.

switches to make the desired connection. The sending machine transmits the predetermined impulses to the switches, which then select, test and signal the wanted line automatically. As soon as this line is selected, however, the secondary selector or operator's switch is automatically released and restored to normal position, ready for another call.

The subscribers have entire control of their own connection, being in this respect situated precisely as in a full automatic exchange, and from the

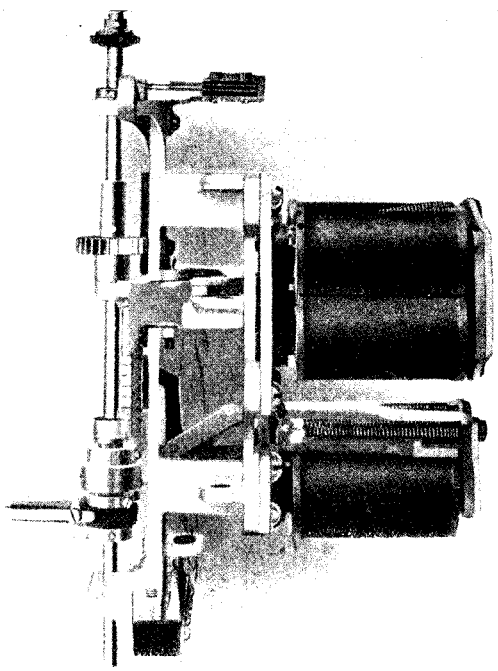


FIG. 3.—TWO-MOTION, 100-POINT SWITCH.

explanation given it will be observed that they are secure from interruption. To clear-out or make a recall the subscribers simply hang up their receivers and the switches are automatically restored.

Aside from standard equipment incident to all common battery installations, such as power plant, protecting and ringing devices, there are only five different pieces of apparatus required to complete an automanual installation, namely, the impulse or sending machine; the operator's keys; the automanual relay; the 100-point two-motion switch, and the twenty-point one-motion switch. The sending machine consists of a drum upon which are placed cams arranged to

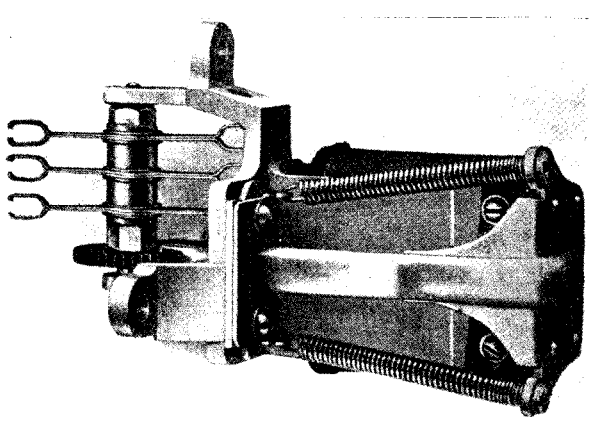


FIG. 4.—DISTRIBUTING SWITCH.

furnish impulses from one to ten in accordance with the keys depressed by the operator. It is driven by a small motor receiving energy directly from the storage batteries. This sending machine is common to the entire system and performs for the system the same functions that in a full automatic installation are performed by the dial or sending device, located at each subscriber's telephone, and herein lies one of the distinctive features of the automanual as a system, namely, the elimination of the dial. Sending machines are required at only the point where operators are located, none being used at branch exchanges.

The relay consists of a core upon which the wire is wound, a frame, an armature and a spring block which serves the double purpose of carrying the contact springs and retaining the armature in place, at the same time allowing freedom of movement.

The 100-point switch provides three switch movements: rotary, vertical and release, the arrangement being as indicated in Fig. 3. The twenty-point,

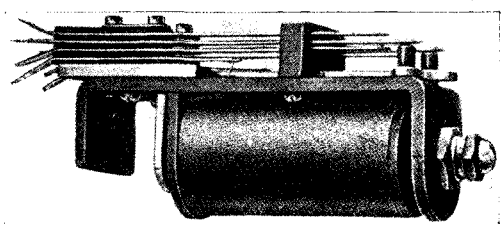


FIG. 5.—AUTOMANUAL RELAY.

one-motion switch is similar in construction to the 100-point switch. All of these devices are characterised by extreme simplicity.

The first automanual telephone equipment to be placed in commercial service was that at Ashtabula, Ohio, a city having a population of about 20,000 people, of whom 5,000 reside at Harbour, about four miles from the main town. The older manual telephone system required seven operators at Harbour and 30 at the main city exchange. The North Electric Company, Cleveland, Ohio, contracted to re-equip both the main city and the Harbour Exchanges, with the idea of starting first at the Harbour with local operators, and after that was successfully working, equipping the main exchange so as to centralise all the operators therein, leaving the Harbour Exchange practically an automatic branch. By following this plan, additional economies will be effected in that the day load at the Harbour will require only one additional operator at the main exchange, and the night load will be handled by a single operator at the city exchange. At Ashtabula Harbour there are installed five 100-line units adapted for either single line or party line service.

The following extract from *Telephony* for Nov. 20, 1909, giving some traffic figures for the Ashtabula Harbour Exchange may also be of interest:—

The Ashtabula Harbour board has now been in operation six months, under conditions as severe as any to be met in telephone practice. Daily tests have been made and careful records kept. These records fully justify the North Electric Company in announcing that all previous estimates have not only been confirmed but exceeded in the showing actually made, as will appear from the following tables:—

OCTOBER RECORD.

	1st	2nd	3rd
Shortest period..	1·60 seconds	2·00 seconds	1·60 seconds
Average five shortest periods	1·92 ,,	2·04 ,,	1·65 ,,
,, ten ,, ,,	1·96 ,,	2·18 ,,	1·80 ,,
Longest period..	12·40 ,,	7·60 ,,	5·40 ,,
Average five longest periods	7·44 ,,	5·52 ,,	5·32 ,,
,, ten ,, ,,	6·34 ,,	5·34 ,,	4·44 ,,
,, entire 100 calls ..	3·36 ,,	3·37 ,,	3·16 ,,
Hourly rate of calls	1,060	1,067	1,139

TEST RECORDS OF 100 CONSECUTIVE CALLS TAKEN BY STOP WATCH—SEPTEMBER, 1909.

	1st	2nd	3rd	4th	5th	6th
Shortest period..	2·00	2·00	1·40	1·80	2·20	2·00
Average five shortest periods	2·00	2·12	1·80	1·92	2·36	2·12
,, ten ,, ,,	2·16	2·26	1·92	1·96	2·44	2·26
Longest period..	7·00	8·20	7·40	5·60	7·40	10·00
Average five longest periods	5·64	7·00	6·36	5·16	6·56	7·68
,, ten ,, ,,	5·06	6·26	5·56	4·86	5·88	6·42
,, entire 100 calls ..	3·20	3·60	3·17	2·94	3·60	3·52
Hourly rate at which calls are being handled	1,125	1,000	1,135	1,224	1,000	1,022

Regarding these figures the North Electric Company states:

"These records represent the time actually spent by the operators in handling the calls tested, and were secured by checking the time between the action of the listening and starting relays with a stop watch.

"They are inaccurate for the reason that it is impossible for any human being to operate a stop watch fast enough to catch the shortest calls, and it is only occasionally that a fairly rapid call is caught, hence the averages above shown are not a fair index of what the operators are actually doing. We hope to be able in the not distant future to show records taken by a chronograph which will show in ink upon a permanent record the actual time consumed down to the one-hundredth part of a second, and are positive that under these conditions the averages will be much better."

DAILY RECORDS OF CALLS FOR THE MONTHS OF

(427 TELEPHONES) AUGUST.				(462 TELEPHONES) OCTOBER.			
Aug. 1, 1909.	Sunday ..	2,142		Oct. 1, 1909.	Friday ..	4,912	
,, 2, ,,	Monday ..	6,414		,, 2, ,,	Saturday ..	5,096	
,, 3, ,,	Tuesday ..	5,856		,, 3, ,,	Sunday ..	2,172	
,, 4, ,,	Wednesday..	6,152		,, 4, ,,	Monday ..	4,944	
,, 5, ,,	Thursday ..	4,904		,, 5, ,,	Tuesday ..	5,004	
,, 6, ,,	Friday ..	5,532		,, 6, ,,	Wednesday ..	4,776	
,, 7, ,,	Saturday ..	5,740		,, 7, ,,	Thursday ..	4,128	
,, 8, ,,	Sunday ..	2,632		,, 8, ,,	Friday ..	4,780	
,, 9, ,,	Monday ..	5,320		,, 9, ,,	Saturday ..	5,364	
,, 10, ,,	Tuesday ..	5,336		,, 10, ,,	Sunday ..	2,564	
,, 11, ,,	Wednesday..	10,988		,, 11, ,,	Monday ..	5,172	
,, 12, ,,	Thursday ..	5,532		,, 12, ,,	Tuesday ..	5,536	
,, 13, ,,	Friday ..	6,816		,, 13, ,,	Wednesday ..	5,448	
,, 14, ,,	Saturday ..	4,588		,, 14, ,,	Thursday ..	5,260	
,, 15, ,,	Sunday ..	2,588		,, 15, ,,	Friday ..	5,476	
,, 16, ,,	Monday ..	5,253		,, 16, ,,	Saturday ..	3,200	
,, 17, ,,	Tuesday ..	5,273		,, 17, ,,	Sunday ..	2,748	
,, 18, ,,	Wednesday..	5,328		,, 18, ,,	Monday ..	4,980	
,, 19, ,,	Thursday ..	6,714		,, 19, ,,	Tuesday ..	5,352	
,, 20, ,,	Friday ..	6,314		,, 20, ,,	Wednesday ..	5,236	
,, 21, ,,	Saturday ..	7,084		,, 21, ,,	Thursday ..	5,228	
,, 22, ,,	Sunday ..	1,380		,, 22, ,,	Friday ..	5,324	
,, 23, ,,	Monday ..	5,720		,, 23, ,,	Saturday ..	6,124	
,, 24, ,,	Tuesday ..	5,284		,, 24, ,,	Sunday ..	3,072	
,, 25, ,,	Wednesday..	7,176		,, 25, ,,	Monday ..	5,660	
,, 26, ,,	Thursday ..	5,140		,, 26, ,,	Tuesday ..	5,612	
,, 27, ,,	Friday ..	4,928		,, 27, ,,	Wednesday ..	4,988	
,, 28, ,,	Saturday ..	7,144		,, 28, ,,	Thursday ..	4,992	
,, 29, ,,	Sunday ..	1,942		,, 29, ,,	Friday ..	5,652	
,, 30, ,,	Monday ..	3,970		,, 30, ,,	Saturday ..	2,488	
,, 31, ,,	Tuesday ..	5,940		,, 31, ,,	Sunday ..	2,607	
Total for month, including Sundays		165,130		Total for month, including Sundays		143,295	
Total for month, excluding Sundays		154,446		Total for month, excluding Sundays		130,732	
Daily average, including Sundays		5,326·77		Daily average, including Sundays		4,622·42	
Daily average, excluding Sundays		5,946·23		Daily average, excluding Sundays		5,028·15	
Average per telephone per day for entire month, including Sundays		12·47		Average per telephone per day for entire month, including Sundays		10·00	
Average per telephone per day for entire month, excluding Sundays		13·91		Average per telephone per day for entire month, excluding Sundays		10·88	
Average per telephone per day, Sundays only.. ..		5·00		Average per telephone per day, Sundays only.. ..		5·43	
Average per telephone per day, Aug. 11, 1909.. ..		25·73		Average per telephone per day, Oct. 23, 1900.. ..		13·25	

The following records of subscriber's waiting time represent the standard of service being received by the subscribers. Averages are based on tests of 100 calls:—

	September	October
Shortest wait	1·00	1·00
Average five shortest waits ..	1·28	1·28
,, ten ,, ,, ..	1·34	1·34
Longest wait	5·20	7·40
Average five longest waits ..	4·64	5·32
,, ten ,, ,, ..	3·80	4·38
,, entire 100 calls ..	2·07	2·20

As in the case of the records showing operating time, the operators did not know that tests were being made, and the usual difficulties attending the operation of a stop watch were experienced.

In connection with these service records, it is interesting to know that an account of calls has been kept ever since the first lines were cut over. An automatic register, consisting of a Veeder counter operated by a relay is permanently connected with each key set, to take this record. The total number of calls which have been handled with the automanual system, beginning in June, has been 796,690, up to Nov. 1. The records show a steady growth in telephones since the automanual system was cut into service, although since the summer months there has been a progressive decline in the number of calls handled, as so much of the business is dependent upon the shipping, which is at its height in the summer season. Business will probably remain approximately stationary from December until April, when it will again build up, but the growth in telephones is a sure indication that the service appeals to the people.

THE NATIONAL TELEPHONE STAFF BENEVOLENT SOCIETY, LONDON.

The following grants were made during the month of December:—

Traffic Department (two)	£5 10 0
Head Office (one)	5 5 0
Maintenance Department (two)	4 0 0
Engineers' Department (four)	11 10 0
Workshops (one)	3 0 0

Total number of grants made since society started—225, value £672 19s. 10d.
Donations received, £14 2s. 1d.
Number of members at Dec. 31, 1909, 2,700.

OPERATORS' AND SUBSCRIBERS' IRREGULARITIES FROM OPPOSITE POINTS OF VIEW.*

OPERATORS' IRREGULARITIES FROM A SUBSCRIBER'S POINT OF VIEW.

ANNIE ELSTIN, *Operator, Swansea.*

IT should be understood that in this paper I have attempted to picture the operator, not as I myself know her to be, but as she is conjectured to be by subscribers—and if there is aught which may seem to you unpleasant, remember I express not my own opinions, but those made known to me by various subscribers with whom I come in contact.

As there are great differences in subscribers, each possessing different conceptions of the operator, it is a matter of no small difficulty to sum up the various views one can and does hear, and give a general opinion of her.

In her daily round, an operator answers subscribers differing in temperament, and to each she appears in a different light. She is sometimes accepted as part of a mechanical appliance called the telephone. She must dexterously deal with her calls and give a speedy and accurate service—for ofttimes urgent business depends upon her alertness. The principal irregularities as they appear from a subscriber's point of view are failure to clear his line or the junction line, leaving him connected perhaps for some time to another subscriber with whom he has finished; promising to ring him when an engaged subscriber is disengaged and failing to do so.

Such irregularities as these do not tend to elevate the operator in the minds of those whom it should be her constant endeavour to assist.

Generally speaking, however, the operator is looked upon as a polite young person willing to do all in her power to assist her subscribers. It is admitted that there are operators whose operating is a boon to a business man, and who is looked up to by him as a great acquisition to his business by reason of her kind, sympathetic tone and attention—and though he, in most cases, does not know her personally, he develops a profound respect for his invisible and unknown friend.

It is this class of operator that raises the standard of the telephone service, and gives the public no justification for terming it a nuisance.

Men of petulant temper have been known to go to the telephone in a tearing rage, which has died away and given place to a gentlemanly manner under the influence of the kind, gentle, but businesslike, voice which has greeted his call.

I fully believe that subscribers are, as a rule, ready to appreciate whatever an operator may do for them, and are willing to be told what to do, or not to do, in order to assist both themselves and the operators. It is certain that subscribers, generally speaking, require educating in the right way to use the telephone, and if the information is given in a polite, businesslike way it is acceptable and has a twofold beneficial effect—first, of convincing the subscriber that the operator is desirous of rendering him whatever assistance she can; and, in the second place, of providing for the operator subscribers who understand fully the correct methods and proper use of the telephone.

SUBSCRIBERS' IRREGULARITIES FROM AN OPERATOR'S POINT OF VIEW.

BY LILIAN ENRIGHT, *Operator, Swansea.*

THERE is not an operator at the "board" to-day who is not fully aware that even the most precise subscriber is guilty of many irregularities, which if eradicated, would add greatly to the comfort of the operator and bring about the ultimate result of a better service.

As operators we must bear in mind the great and important fact that it is our duty to assist the public, who should be our

* Abridged from papers read before the Swansea Operators' Telephone Society.

first consideration. This renders it necessary to cultivate that profound virtue "patience," and to season our conduct with forbearance, in order that the most irate subscriber may be soothed by the operator's "soft answer which hardly ever fails to turn away wrath," bearing in mind the adage, "you can never judge a man's importance by the noise he makes at the telephone."

The subscriber stands in much the same relationship to us as the buyer to the seller, and reserves the right to criticise our goods, and to express his opinion generally on the service, but experience teaches us that the feeling of the subscriber towards the operator is regulated, I do not say wholly, but to a large extent by the manner she displays.

We must remember that a subscriber has many business worries of which we know nothing, and he not unreasonably expects from the operator courteous and sympathetic assistance.

Such an irregularity on the part of the subscriber as excessive use of the generator causes much unpleasantness. It is not too much to expect a subscriber to know that it requires but half a turn of the handle to drop the indicator and to call attention. The impression so prevalent is that the harder he rings the quicker he will be answered, it being apparently not known that continued ringing, in addition to trying the temper of the operator by giving her a sharp shock in her ear, has probably also forced her to wait for him to finish, two or three subsequent callers having meanwhile been connected to their respective numbers, so that the delay resulting from his ignorance has been his loss, since to him "time is money."

He is also fond of omitting the name of the exchange, and does not display a very placid disposition when this information is requisitioned.

The average subscriber is doubtless hard to please, lacking in his treatment of the operator the respect which the gentler rightfully expects from the sterner sex.

There are, of course, instances contrasting strongly with this class of subscriber, those who are ready and willing to give credit where it is due, recognising that the operator is deserving of appreciation.

Sympathy between operator and subscriber certainly removes many misunderstandings which irritability causes. It is advantageous too from a service point of view, because the operator becomes conversant with the subscriber's methods and temperament and can qualify her tone and manner accordingly.

It is not too much to expect of a subscriber that he should take the trouble to educate himself, or allow himself to be educated, in the correct mode of operation, the knowledge gained thereby rendering it possible for him to understand the process involved in the completion of connections for him. This knowledge it is found not only causes a subscriber to interest himself in his method of using the telephone, but has a decided tendency to bring about an improvement in his service, so that with the co-operation of the operator he may utilise the telephone for the advancement of his business.

To sum up, therefore, I strongly emphasise the need for healthy co-operation between subscriber and operator, believing that by such means the telephone may be utilised to its fullest extent, and those who have hitherto regarded it as a nuisance will henceforth readily see in it a boon to every department of life.

THE NATIONAL TELEPHONE COMPANY'S EMPLOYEES' SICK, DIVIDEND AND BENEVOLENT SOCIETY, BIRMINGHAM AND DISTRICT.

THE annual general meeting of the above society took place on Thursday, Dec. 16, at the Market Hotel, when a large assemblage of members were presented with the balance sheet for the year, which all agreed was very satisfactory. After meeting expenses, amounting to £47 12s. 9d., a dividend of 10s. 2d. per member was declared. A *résumé* of the committee's work during the year 1909 was read, and the following officers and committee for the year 1910 were elected:—President, Mr. Warwick Bagley; vice-presidents, Messrs. R. U. Tucker and J. Sinclair Terras; treasurer, Mr. W. Lambourne; secretary, Mr. Stephen Wood; trustees, Messrs. R. U. Tucker and J. Sinclair Terras; committee, Messrs. S. O. Allen, W. Allen, Alcock, Cross, Bayliss, Meredith, Newton, Price and Rhodes; auditors, Messrs. Turner and Radford. After the meeting a very enjoyable smoking concert took place.

THE FIRE AT MESSRS. ARDING & HOBBS, CLAPHAM JUNCTION.

THE recent disastrous fire which occurred on the premises of Messrs. Arding & Hobbs, the well-known drapers and furnishers at Clapham Junction, caused some anxiety to the Company's officials in view of the fact that the Battersea premises are nearly opposite. The wind, being in the direction of the exchange, carried a great quantity of burning material across the road, which fell upon the roofs of the exchange and neighbouring buildings. There was a veritable storm of sparks, which created considerable uneasiness amongst those in charge of the building. The local staff fire brigade, under the direction of Mr. Blick, Divisional Engineer, made excellent use of the opportunity of displaying their proficiency with the hose, which they handled with good effect. Their efforts undoubtedly averted what at one time appeared a very real danger, and the greatest praise is due to them for their valuable services on the occasion.

The operating staff, owing to the great heat, which was uncomfortably felt in the switchroom, were in the first instance somewhat apprehensive of danger, but, in spite of this, they "manfully" stuck to their posts throughout and carried out their duties most efficiently. With the knowledge of a fire raging on the opposite side of the road, it required more than ordinary nerve to sit calmly at the switchboard and deal with the large number of extra calls which it caused. The greatest credit is due to the coolness which the operators displayed under these most trying circumstances—and they are to be highly commended for their pluck. Owing to the large increase in the traffic it was not until eight o'clock that the services of the full day staff could be dispensed with. In the meantime complete arrangements had been made by those in authority to get the operators rapidly out of the building in case of necessity, so that had an emergency arisen their safety was assured.

CORRESPONDENCE.

FUSES.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

WITH reference to my letter in the November issue of the JOURNAL, I should like to thank Mr. Taylor for his interesting reply, and would venture to make the following remarks:—

He states that copper has a high melting point, and therefore does not fuse easily. Surely this difficulty can easily be overcome by using a fuse of a suitable size.

With regard to the second point, that copper becomes oxidised, and may fuse under normal fusing current, here I would point out that copper will only become oxidised when under persistent overload, and hence the lower carrying capacity and consequent blowing of the fuse under these circumstances may be an advantage. I think the breakage and discolouring effects of apparatus are due to these being wrongly designed for the purpose. At the same time, far more particles and fumes are produced with soft metal fuses than with copper. Further, with regard to Mr. Taylor's objection to copper on the ground of expense, I find from figures I have obtained that a copper fuse is cheaper than a lead fuse of the same carrying capacity.

Mr. Taylor also states that he is in favour of lead for a branch fuse on account of its low melting point, and will therefore blow first. In answer to this I wish to draw his attention to the fact that the time element of lead is greater than copper when both fuses are of the same normal fusing current and have the same percentage overload on them, and that lead is far more slugggish in its action. From this I would assume that it would be better to have branch fuses of copper and the main fuse of lead, which is the reverse of the statement made. At the same time, it seems to me if both the main and the branch fuses are of the same metal, and correctly proportioned, in the case of overload the smaller would go first.

I would add that the wiring rules of the Institute of Electrical Engineers recommend hard metal for fuses.

Bradford, Dec. 20. "SHORT CIRCUIT."

THE PUBLIC CALL OFFICE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

RECOGNISING the value of call offices as excellent revenue earners, I read with interest Mr. J. M. Stewart's contribution in the December JOURNAL.

His statement that *Glasgow stands as the best public telephoned city in the kingdom* will, I am sure, be disputed.

I have a comparison to make, viz.:

	Glasgow.	Hull.
Population	1,000,000	270,000
Call offices	1,280	420
Inhabitants to every call office	781	642

The number of call offices in Glasgow has been taken from the July, 1909, directory, and as it includes every exchange in the area additional population needs to be added.

Taking the population in 1905 at 809,000 and allowing for a natural increase year by year and adding estimated figures for the numerous suburbs, I reckon 1,000,000 will about reach the actual figure.

There is, therefore, a difference between the figures given in the JOURNAL, with which Hull compares favourably. Even taking the 1905 population of 809,000, it is hard to get the average of one call office to every 500 people.

Probably Mr. Stewart may have an explanation, to which I shall listen with pleasure but, meanwhile, I am sceptical.

Hull, Dec. 18. A. K. M.

RING-OFF INDICATORS.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

AN experiment has been tried in Sheffield which may be of interest to exchange managers and others who are in charge of magneto boards.

The ring-off indicators have been painted on the inside in accordance with the colours of the cords, in our case, alternately red and white.

All operators who have worked on these positions claim that it is a considerable help to quick clearing, an operator being able to pick out a particular cord more readily by the colours than by the numbers.

Sheffield, Dec. 18. S. R. VAUGHAN, Exchange Manager.

LONDON NOTES.

ON the football field the Workshop team has redeemed the laurels lost to Salisbury House in the first round for the Clay Challenge Cup. The return match was played on Jan. 8, the "Shop" winning by the narrow margin of 1 goal to *nil*.

MR. R. J. PAYNE was married recently, and his colleagues in the Metropolitan Cashiers' office presented him with a barometer as a wedding gift. Mr. Payne is one of the Senior Cashiers, has been president of the benevolent society for some years, and has won many honours in ambulance work.

THE "Hospital Saturday Fund" collections for 1909 have yielded £715 19*s*. 1*d*. This result is eminently satisfactory, and one of which the staff may well be proud. It is not, however, all that the telephone staff do for the fund. Many of them put in some hard work on the fund's standing committees, and in this way take their share in the administration of a growing and helpful organisation.

THIS extract from a letter written to the Company by a City subscriber is worthy of reproduction:—"I must express my great admiration for the very expeditious manner in which your workman has done the work. If all our workmen had the same capacity, and were as willing, the country would have nothing to complain about." It seems a natural inclination to emphasise trouble, and be silent when things go well; we all do it. If for its rarity alone, therefore, such a letter would be welcome and refreshing; it is doubly so when it pays a well-merited tribute to the general excellence of our work.

THE annual meeting of the benevolent society will not have been held before these notes go to press. The annual report, however, shows some interesting figures, and some creditable results to which the bald figures are but the index. During the year £278 13*s*. 11*d*. was disbursed in 95 grants, making a total disbursement since the founding of the society of £672 19*s*. 10*d*. What this may have meant to the recipients in their time of need it is impossible to tabulate. The earnestness and unselfishness of the committee are worthy of all praise.

MR. G. BROWN, Local Engineer, Battersea, who has been incapacitated through illness, has now returned to duty after six weeks' absence. Mr. Brown is well known to the staff, as he is the Senior Local Engineer, and will complete 30 years' service in January next.

AT the telephone society's meeting on Jan. 5 the "Traffic" paper selected for the Head Office competition was read. Mr. A. H. Dyer, Exchange Manager, Holborn, was the successful competitor. His paper was an excellent *resumé* of traffic work in a common battery exchange. Much of it was elementary, but that did not detract from its value. A little more explanation of some of the diagrams was desirable, as some controversy, not afterwards cleared up, arose in the subsequent discussion. The meeting gave a cordial welcome to Mr. H. Laws Webb, who took part in the debate on Mr. Dyer's paper.

THE report of the Operators' Provident Society was unfortunately too late for January. A most satisfactory year's working is the verdict for 1909. The membership is now 1,315. May I enumerate the benefits?

(1) Sick benefit at 5*s*. per week for thirteen weeks. Very useful for doctor's bills and sick-room requirements. £334 10*s*. was disbursed in this way during 1909.

(2) Payment of £10 to relatives in event of death.

(3) Division of surplus funds at end of year. Over £470 was divided in this way last year.

The contributions are small; all operators should join. The collecting stewards at the exchanges will gladly furnish information.

THE traffic branch of the telephone society continues its feast of good things. On Jan. 13 two papers were read: "The Management of a Small Exchange," by Miss A. Sayer, and "The Education of Subscribers," by Mr. R. W. Gregory. The first paper was particularly welcome, as until a year or so ago very few people knew or cared anything about the small exchanges. We have travelled far in that respect during the last twelve months. Both papers were very interesting, but rather lost in effect through the low-pitched voices of the readers. There was an animated discussion, but the attendance of 100 was disappointing.

FRIDAY, Feb. 18, has been fixed for the Metropolitan Staff Dinner. It will again be held at Frascati's. The committee are preparing a specially good programme, and those who remember the excellence of last year's entertainment will certainly support the committee in their efforts. Let us have a bumper house this year.

THE past and present staff of Gerrard district had a very successful dinner on Jan. 7. Mr. Greenham was in the chair, and took occasion to relate some interesting reminiscences of old Gerrard days. A capital musical programme added considerably to the enjoyment.

ELECTION work taxed the energies of the Traffic Department during January. A central information office was established at Holborn Exchange, and from thence results were distributed to other large exchanges for communication to enquiring subscribers. On the first night about 17,000 additional calls had to be dealt with. The general opinion is that the interest taken in the election was even keener than in 1906, this, of course, being reflected in the traffic. Special election lines numbered 92, the stations being 137. In the West End enquiries were fewer than before, but this was compensated for by an increase of calls at suburban exchanges, such as Esher, Tilbury and Hammersmith. The arrangements for the comfort of the operators on special duty and for sending them home in taxi-cabs, as the tide of traffic ebbed, were well planned and admirably carried out.

GLASGOW NOTES.

THE first annual dinner of the National Telephone Bowling Club was held in Sloan's Arcade Café on the evening of Friday, Dec. 17. Mr. James Forrester occupied the chair, and he was supported by the other officials of the club and by Bailie R. S. Brown, who represented the Corporation. After the usual loyal toasts had been duly honoured, Bailie Brown proposed the toast of the evening, and in the course of his remarks referred to the use made of the Corporation greens by the club. A varied programme was submitted during the evening, and was much enjoyed.

THE monthly meeting of the National Telephone Society was held in the Technical College at 7 30 p.m, on Jan. 12, when Mr. Gilbert presided over a good attendance of members. Two papers prepared for the special Head Office competition were read, the first, entitled "The Power Plant; or the Conversion of Energy," being submitted by Mr. Jas. Forrester, and the second, "The Psychology of the Office," by Mr. Jas. F. Scott. The papers, which followed the lines indicated by their titles, dealt with constantly recurring problems in a fresh and original manner which appealed to the audience, and a lively discussion followed. A visit to the refectory for refreshment terminated the proceedings.

THE third meeting of the session of the Operators' Telephone Society was held in the Masonic Halls, West Regent Street, Glasgow, on the evening of Dec. 27, when papers on "The Training of the Operating Staff" and "The Education of the Telephone Subscriber" were contributed by Mr. C. N. Carter, Exchange Manager, Hillhead Exchange. In the former Mr. Carter dealt particularly with the training of the learner from the time she entered the switchroom, and in the latter he indicated the part to be played by the operator in the education of the subscriber. A good discussion followed the reading of the papers.

The third meeting of the club was afterwards opened, when a programme of songs, readings, pianoforte selections and dancing was taken part in by the members.

AT the time of writing the excitement of the General Election has reached fever heat. The active members of the staff associations have had their hands full, and now the burden has been transferred to the operators, on whom devolves the duty of replying to the questions asked by an impatient and anxious electorate. The arrangements made to cope with the special circumstances are proving entirely satisfactory, and as usual it is the telephone subscriber who secures the latest information with the greatest despatch and the least trouble.

IN the course of an important speech here on Wednesday, Jan. 12, Mr. Winston Churchill made reference to his visit to the Labour Exchange premises shortly to be opened in Glasgow by the Board of Trade as headquarters for Scotland, and spoke of the telephone facilities being provided for ascertaining the state of the labour market in different parts of the country. In this connection it is interesting to relate that while the first intention was simply to take a direct line to the exchange, it has now been arranged on the Company's recommendation for private branch exchanges with direct lines and extensions to be installed in several of the Labour Exchange offices, and it is further understood that generous telephonic provision is now being made throughout the country.

LOCAL TELEPHONE SOCIETIES.

Birmingham Operators.—The fourth meeting of the session was held at the Queen's College on Jan. 13. The chair was taken by Miss F. Smith, Supervisor at the Central Exchange, and short papers were read by the following members:—Miss G. E. Goodenough, on "Exchange Clerical Work"; Miss M. E. Colledge, on "Common Battery 'A' Operating"; Miss J. Ife, on "Night Operating"; Miss M. E. Clift, on "Outer Exchange Working"; Miss E. M. Terry, on "Registration of Calls"; Miss E. Ife, on "Common Battery Exchange Testing"; Jewellers' Operator, on "The Advantages of the Transfer." The

business was followed by a social gathering, in which members of the electrical, contract and traffic staffs participated. The evening was very enjoyably spent.

Birmingham.—The fourth meeting of the society was held in the operators' dining-room, Central Exchange, on Jan. 4, when a paper was read by Mr. Tucker, Chief Clerk, entitled "Office Routine." The lecturer dealt with the invoice and cash sections of the district office, also the working of the works order distributor. He explained in detail the various forms of receipts and the method of keeping records of measured rate calls. A large number of lantern slides were shown, and an interesting discussion followed.

Blackburn.—The third meeting of the session was held on Dec. 17, with Mr. Remington in the chair, when Miss Maclachlan, Clerk-in-Charge, Burnley, read a paper entitled "Some Points on Operating." The subject was treated in a comprehensive way, and useful suggestions were offered as to the best methods to be adopted by those aspiring to become efficient operators. Miss Healey, Clerk-in-Charge, Blackburn, criticised the paper, whilst many other operators and several male staff members kept up a keen discussion for close upon two hours.

Bournemouth.—The fourth meeting was held on Jan. 10, when Mr. W. Moore gave a paper, "Notes on Underground Work." Mr. Harper, Local Manager, was in the chair. There were 28 members present. At the conclusion of the paper a good discussion was carried on, in which Messrs. Young, Mason, Harris and others took part.

Bristol.—The fourth sessional meeting was held on Jan. 13, when a paper was given by Mr. A. E. Coombs, Traffic Manager, on "The Organisation of a Day's Originating Traffic at the Bristol Exchange." The following were the leading heads of the paper:—(1) Calls as they reach the exchange from the subscriber; (2) value of these calls as between the various services, flat, measured, call offices, etc.; (3) depreciation of an operator's efficiency according to number of positions filled; (4) operating duty wheel and how arranged; (5) operator's individual duties and how divided amongst staff. There was an excellent attendance (70), representing 75 per cent. of the staff, and an interesting discussion ensued. The District Manager (Mr. A. Perkins) presided, and he was supported by the Provincial Superintendent (Mr. R. A. Dalzell).

Bristol Operators.—The fourth sessional meeting was held on Jan. 13, when a lecture was delivered by Mr. A. E. Coombs, Traffic Manager, on "London Impressions, Telephonic and Otherwise." Mr. Coombs gave an interesting and instructive sketch of his recent visit to London, and outlined the various sections of the Traffic Department and exchanges he had visited when there.

Cardiff.—The third meeting was held at St. John's Schoolrooms, Cardiff, on Dec. 16, Mr. J. James being in the chair. There was a good attendance. The first part of the evening was occupied by a paper by Foreman H. J. Ginn on "Blockwiring," and the later part by Foreman W. Edwards with a paper entitled "Distributing Pole Work with Efficiency and Economy in Maintenance." Both papers were dealt with in a lucid manner, and one or two interesting points were raised. A discussion followed, after which the evening was brought to a close.

Cardiff Operators.—The monthly meeting was held on Dec. 14. The chair was taken by the District Manager, Mr. B. Waite; 46 of the members were present, as well as the vice-president and six members of the Newport staff. A paper entitled "Problems in Connection with Distribution of Load," was given by Mr. R. A. Dalzell (Provincial Superintendent). The subject—necessarily a scientific one—proved most interesting, and the more difficult points were explained by means of charts.

The meeting on Jan. 11 was arranged as a competitive night, four papers being read by the Misses L. Wheeler, C. Palmer, E. Burton and W. M. Davies, the subjects being respectively, "Handling of Apparatus," "Subscribers' Irregularities from an Operator's Point of View," "The Three Cardinal Points in Operating," and "The Advantages of a Private Branch Exchange where a Company's Operator is Installed." All four papers were very interesting, and a good discussion followed. As several of the vice-presidents were unable to be present, the clerk-in-charge and supervisors were asked to act as adjudicators with the vice-presidents who were there. The first prize of 7s. 6d. was awarded to Miss W. M. Davies, and the second prize of 5s. to Miss L. Wheeler.

Coventry.—The monthly meeting was held on Dec. 20. Mr. J. Mewburn, president, was in the chair, supported by nineteen members and six guests. Mr. A. Booth gave a paper on "Rates and their Effect upon the Office Routine," followed by an interesting discussion.

A meeting was held on Jan. 11 at Priory Row Assembly Rooms, when Mr. J. Mewburn, president, presided over an attendance of fourteen members and three guests, the percentage of attendance of members being 63·63 per cent. Mr. G. F. Pope gave a paper on "Transmission," illustrating it by a number of diagrams and charts.

Cheltenham.—The fifth meeting was held on Jan. 4, 100 per cent. of the members being present. A well-written paper on "Iron" was given by Mr. G. R. Collings, treating with its production from the ore, its properties and its application in telephone apparatus.

Cornwall.—The second meeting was held on Nov. 17, when two papers were read entitled "Underground Construction," by Mr. A. H. Mansfield, and "The Value of Records," by Mr. W. S. Griffiths. Both papers were illustrated by the society's lantern, the slides being prepared by the readers of the papers. Eighty per cent. of the members being present.

The third meeting of the society was held on Dec. 8, a paper being read by Miss M. C. Jinkin, Plymouth, entitled "The Operator and Travelling Supervisor." Eighty per cent. of the members being present, including seven of the operators.

Dublin.—The third meeting of the session was held on Dec. 1, when a paper was read by Mr. W. Higson, Exchange Manager in-Training, on "Subscribers' Irregularities and their Effect on the Service." The subject was dealt with in a capable manner and contained a number of very interesting points of discussion.

The fourth meeting was held on Dec. 22, Mr. R. Morgan occupying the chair. A paper was read by Mr. G. Kneale on "Wireless Telegraphy," in which he lucidly explained the working of the various systems in practical use, and illustrated his remarks by a series of large diagrams. An interesting discussion and a vote of thanks closed the meeting.

East Kent.—The fourth meeting was held in the district offices on Jan. 18, when two very interesting and instructive papers were given before a good attendance, (1) by Mr. F. Duerth, Local Manager, Dover, on "Some Marine Telephones"; (2) by Mr. E. T. French, Fee Clerk, district office, on "Measured Rate Accounting."

Exeter.—The second meeting of the session was held on Nov. 23, Mr. W. Sim being in the chair. Paper, "Inspections and Optimism," by Messrs. C. Downey and C. Parkhouse; 78 per cent. of the members were present and a good discussion resulted.

The third meeting was held on Dec. 14, Mr. H. Martin being in the chair. Paper, "Traffic: Its Relation to the Service, the Public and the Administration," by Mr. H. Reid, District Manager; 86 per cent. of the members attended and Messrs. Bennett, Brown, Sim and Southwell with others took part in the discussion which ensued.

The fourth meeting of the session was held on Jan. 11, Mr. F. Squire in the chair. A paper, "Faults and the Inspector," was read by Mr. W. H. Robnett, Chief Inspector, Torquay. Interesting diagrams were shown, and a very fair discussion took place. Owing to sickness and the bad weather the attendance was not up to the average.

Gloucester.—The third meeting of the session was held on Dec. 16, the District Manager, Mr. C. Elliott, being in the chair. Three very excellent papers were read. "Wayleaves," G. A. Greenland, Inspector-in-Charge, Hereford; "Local Office Work," C. J. Poulter, Local Office Clerk, Hereford; "Contract Working," P. W. Luscombe, Contract Officer, Stroud. Each paper in turn created much enthusiasm, and considerable discussion followed. Special interest and appreciation was displayed in the paper read by C. J. Poulter, who is a junior member of the staff, and has only been in the Company's service twelve months.

Greenock.—The fourth meeting was held on Dec. 16. The evening was devoted to a lecture by Mr. A. Wilson, Electrician, and a visit was paid to a modern common battery exchange. The lecture covered an explanation of the various apparatus, switchboards, etc., and afterwards these were inspected by the company present.

Hastings and Eastbourne.—A meeting was held at the Y.M.C.A. Rooms, Eastbourne, on Jan. 12, when a very interesting paper was read by Mr. F. Thompson on "Local Office Work," which raised a considerable amount of discussion. Twenty-five members were present, including sixteen from Hastings, with Mr. Armstrong, the Local Manager. Mr. R. Curling, Local Manager, Eastbourne, was in the chair.

Isle of Man.—The seventh meeting was held on Jan. 7. A demonstration was given by the District Manager, assisted by Line Foreman Smith, showing the best and quickest way to get up broken wires in case of breakdown. Wires and arms were fixed in the room, and the various methods gone through and explained. After the demonstration the District Manager illustrated several methods of getting round tight corners in construction. The lecture fixed for this date was on "Dry Air Testing," but the District Manager explained that as he had mostly dealt with this in his paper on "Underground," he thought, as they were surrounded by storms, it was best to rub up their knowledge to meet them.

Leeds.—The subject of consideration at the meeting held on Jan. 5 was "Contract." Papers were read by Messrs. Corlett, Burdett and Senior. A lively discussion ensued.

An excellent lecture on "Operating in General" was given to the operators on Nov. 22 by the Exchange Manager, Mr. A. L. May, and repeated on Nov. 29 to suit the convenience of the staff, who were all present. The lecturer dealt with operating and subscribers' irregularities, care of apparatus, &c. The lecture was both interesting and instructive, and another one will be given in the near future.

Leicester.—On Nov. 19 the society held its second meeting. The number of members present was 73 per cent., the president (Mr. M. Marsden) being in the chair. Mr. F. Lucas (Contract Manager) read a paper, "Views and Interviews," which was made particularly interesting by a comparison of the telephone rates of this country with those of other countries. Mr. P. V. Sansome also read a paper on "Traffic Studies," but unfortunately there was not much time for the discussion of this interesting and debatable subject.

The third meeting was held on Dec. 10 at the Foresters' Institute, and attended by 49 per cent. of the total members. In addition there were six visitors; the president again took the chair. Miss M. A. Law (Chief Operator) read an interesting account of the general meeting, dealing with traffic questions, which was much appreciated by all present. Mr. A. W. Garrard (Sub-Engineer) read an instructive paper on "Useful Knots and Splices," giving a practical demonstration of the most important.

The fourth meeting was held on Jan. 14 at the Institute and was devoted to a lantern lecture, entitled "Transmission and its Application," given by Mr. H. P. Lloyd (Birmingham). The lecturer dealt in a very interesting manner with the relation of transmission to costs, also the compensating values of loading on cables, and illustrated the allowances made for common battery working. The lantern slides were all very excellent, and helped to make clear many of the problems expounded.

Liverpool and Birkenhead.—The third meeting took place on Dec. 16 at the Clarion Café, Mr. E. S. Francis, the president, being in the chair. Mr. R. Hunt, Divisional Engineer, read a paper on "Line Construction." A large number of very instructive slides were shown, chiefly relating to pole erection, splicing and standard erection. A useful discussion took place.

Liverpool and Birkenhead Operators.—The first meeting took place on Nov. 30 in the Clarion Café. Miss E. M. Jones presided. There were 185 members present. Eight papers on "Team Work" were read by lady members. These papers were very interesting, and much appreciated, and for the purpose of friendly discussion four were written on the advantages of team work, and (a

more difficult task) four on the disadvantages of team work. A discussion followed, in which various members took part. Miss C. A. Durandeau, formerly superintendent of the sub-exchanges in Liverpool, now clerk-in-charge of the Bank exchange, was presented with a gold bangle, the gift of the operating staff of the sub-exchanges. Mr. E. J. Hidden made the presentation.

The second meeting took place on Jan. 4 at Kirkland's Café, Bold Street. At this meeting "Order Wire Working" was the subject chosen for discussion, and six papers on this interesting and instructive subject were read by operators. The papers were all well received, and numerous questions were asked. After the business part of the evening was over, the "Bohemian Quartette" very kindly gave selections, and these were very much appreciated by all present.

London.—A meeting was held at Salisbury House on Jan. 5 with an attendance of 122. Mr. L. Harvey Lowe (in the chair) asked Mr. A. H. Dyer to read his paper on "Traffic." This paper is the one chosen in London to rank as the competitive paper in the Head Office competition, and in the words of one of the speakers, Mr A. H. Dyer made a very masterful attempt to cover the whole subject. The following members took part in the discussion:—Messrs. H. Corner, W. Benham, W. D. Stewart, H. Laws Webb, J. Stirling, J. F. Edmonds, G. Hollings, Miss A. Reekie, and Miss J. McMillan.

London (Traffic Branch).—The fourth meeting of the session was held in the Great Hall, Salisbury House, on Jan. 13, Miss F. J Minter being in the chair. There were 173 members present. Miss E. Sayer, Clerk-in-Charge, Enfield, read a paper on "The Management of a Small Exchange," and an interesting discussion followed on operators' valued loads and also on transmission difficulties. Mr R. Gregory, Assistant Exchange Manager, Gerrard, read a paper on "The Education of Subscribers." In the discussion which followed some amusing anecdotes were related, and were much enjoyed. The following members took part in the discussions:—Misses Hooper, Ryder, Goodway, Mobley, Berry, Flinn, Bailey, Reid, Etheredge, and Messrs. Abbott, Ward, Cohen, Napier, Ware, Clay and Webb.

Manchester.—The third meeting was set apart as a members' night, five papers being read by the members. Three prizes were offered, and these were won respectively by Messrs. Bathgate and Drake, Mr. C. H. Taylor, and Mr. A. Jackson. Quite a series of interesting discussions followed the reading of the papers.

The fourth meeting of the session was held on Dec. 3, when Mr. R K. Keer read a paper on "Preparation of Cross-Connecting Lists." A most interesting paper was followed by an animated discussion.

Northampton.—A meeting was held in the inspectors' room on Jan. 4, when a very interesting paper was given by Mr. E. C. Bailey on "Power Plant," accompanied by lantern slides, after which a general discussion followed.

North-East London.—The third meeting of the session was held on Dec. 20 at East Exchange, when the Divisional Contract Agent, Mr. Robert P. Lowe, read a paper on "The Contract Department and Its Relation to other Departments." Mr. H. S. Peck, vice-president, took the chair. Mr. Lowe in his paper explained how the department was constituted and described the various methods of recording visits The paper was well received and afterwards was followed by an interesting discussion.

Nottingham.—The fourth meeting took place on Jan. 10, Mr. Fenton presiding; 74 present. Mr. F. Pinder gave a very interesting demonstration on a simple lathe of "Making and Duplicating Instrument Parts." The making of the necessary tools was fully described, particular attention being called to the necessity of the accuracy of the "cutting" and "clearing" angles of the same. A very fine set of diagrams illustrating the subject of tool making were on view, together with samples of tools used by Mr. Pinder at the factory. It may be of interest to note that the diagrams are to be copied and placed in several of the workshops at the factory for the benefit of the staff.

Oldham.—Mr. Shinn, of Ashton, gave an interesting paper upon "Efficiency and Economy." The subject was carefully treated, and points of economy explained from an engineering point of view.

Paisley.—The fourth meeting of the session was held in Hutton's Restaurant on Jan. 14, Mr. R. Audsley, Local Manager, presiding. The subject, "Line Construction," was very ably expounded by Mr. W. McPhail, Assistant Engineer. He dealt first of all with ground poles, class, method of erecting, staying, etc, roof poles, insulators, wires, etc., showing all the different methods of making off jointings, etc. An open discussion took place.

Sheffield.—The fourth meeting was held at the Central Café, High Street, on Jan. 14. Mr. J. Hyde's paper on "The Automatic Exchange," was read before a large attendance. Considerable discussion took place at the conclusion of the paper.

Southern London.—A meeting was held on Dec. 14, when Mr. E. R. Chambers read a paper on "The Test Clerk's Duties," illustrated by lantern. The various duties performed by the test clerk were well described, and several of the members participated in the discussion which followed.

Swansea Operators.—The fourth sessional meeting was held at the Docks Exchange Hall on Jan. 5, Mr. W. E. Gauntlett occupying the chair, when a lecture was given by Mr. A. E. Coombs, Traffic Manager, Bristol, entitled "Impressions of London, Telephonic and Otherwise." There were several visitors, including Mr. R. A. Dalzell. The lecture, which was illustrated by lantern slides, comprised some interesting impressions of the chief London exchanges, their premises, equipment and organisation.

Torquay.—The first meeting was held on Nov. 29, when the president, Mr. H. Reid, gave an address, and subsequently read a paper, "Traffic Statistics." Diagrams were shown to illustrate the various points, and there was a good discussion.

The second meeting was held on Dec. 6, Mr. G. E. Williamson being in the chair. Mr. D. J. Meikleham, Plymouth, read a paper, "Telephone Development," and a general discussion ensued.

The third meeting was held on Dec. 20, when Mr. Robnett read a paper, "Switchboard Development." The subject was dealt with in an interesting manner. Samples of apparatus, photographs, etc., were shown, and a good discussion followed.

The fourth meeting was held on Jan. 10, when Mr A. H. Morgon read a paper, "From Interview to Connection," and he fully dealt with the subject, particularly wayleave troubles. An animated discussion followed.

Western London.—The monthly meeting was held at Gerrard Exchange on Nov. 25 last, on which occasion a paper on "Instrument Inspector's Temporary 'O.K.'s'" was read by Mr. H. C. Smeed, and afterward discussed.

A further meeting was held on Jan. 6, when Mr. G. E. Boniface read a paper on "Line Faults and their Cause." This proved very interesting, and several pieces of apparatus were shown to illustrate points mentioned. A discussion followed the reading.

Nottingham. The fourth meeting was held on Jan. 14, when a paper was read by Mr. T. Justin of the Contract Department, on "Interviews," and in the subsequent discussion nine members took part. The principal points were the arguments to be used in canvassing for private branch exchanges, and considerable criticism was evoked.

Luton.—Mr. S. J. Cain, Chief Inspector Luton, read a paper entitled "Fitting and Maintenance" before a meeting of this society under the chairmanship of Mr. J. H. Wilson on Jan. 17. This is the third consecutive year Mr. Cain has given a paper and, as before, he treated his subject in a very able manner.

Brighton.—A meeting was held on Jan. 10, when an excellent paper by Mr. A. Brackley was given, the subject being "Subscribers' Instrument and Exchange Faults." A discussion followed. There was a fair attendance, Mr. Moorhouse, the district manager, being in the chair.

Manchester.—Under this heading on page 197 of our December issue the name of the General Electric instead of the Western Electric Company was given.

NEWS OF THE STAFF.

Mr. J. R. PEACOCK, on leaving Leeds for Dublin, upon his promotion to be Contract Manager for that district, was presented with a silver flower stand. The presentation was made by Mr. W. V. Morten, District Manager, who spoke in appreciation of Mr. Peacock's services in the Leeds district, and conveyed the best wishes of the staff to Mr. Peacock in his new sphere.

Mr. A. COLEMAN, jun., who has been connected with the Company for some years in various parts of the country, and latterly with the Liverpool district, was the recipient of a presentation by the staff of that district upon his leaving the Company's service to take up work in the missionary field in New Guinea, under the auspices of the London Missionary Society. The presentation, which took the form of a well-appointed medical case, was made by the District Manager, Mr. E. J. Hidden, who testified to the sterling qualities of Mr. Coleman, and was supported by the Engineer, Mr. C. S. Wolstenholme.

Mr. R. B. GRAHAM, Inspector-in-Charge, Dublin, has been promoted to the position of Local Engineer, Liverpool. The District Manager, Mr. Currall, on behalf of the staff, presented him with a travelling bag, rug and other articles and expressed the regret of the staff at Mr. Graham's leaving Dublin.

Mr. J. R. PEACOCK has been transferred from Leeds to the position of Contract Manager, Dublin.

Mr. NORMAN BLAND NOBLE, Exchange Manager in Training, Bristol, has been appointed Exchange Manager, Bristol. He entered the Company's service in April, 1902, at Warrington, as an apprentice, and rose to the rank of Exchange Inspector there. In September, 1907, Mr. Noble was transferred to Bristol as Instrument Inspector, and in March, 1908, was appointed Exchange Manager in Training at Bristol.

Miss MARION MONTAGUE FREWIN, Post Office Fee Clerk, Reading, was presented by members of the staff with a gold brooch on resigning her position in the Company's service.

Mr. FREDERICK W. JACKSON, Fitter, Manchester, has been transferred to Brighton in a similar capacity.

Miss FLORENCE MARY JOHNSON, Operator, Clacton-on-Sea, has been transferred to Brighton to a similar position. Unfortunately, however, she is immediately resigning, owing to illness in her family.

Mr. F. CREASE, Inspector, Brighton, has resigned in order to take up a good appointment in Canada, and was presented on leaving with a handsome leather writing case suitably inscribed.

Mr. ALFRED READ, Chief Inspector, Chatham, has been transferred to Hastings in a similar capacity.

Miss DAISY GOLL, Operator, Hop Exchange, London, has been transferred to Brighton.

Miss CONSTANCE EVELINE HUGHES, Sheffield, on resigning her position as Operator, through ill-health, was presented by her colleagues with a butter dish and knife.

Mr. A. J. HAWKINS, Contract Officer, Leicester, has been transferred to Dublin in similar capacity. Prior to his departure he was presented by the staff generally with a case of pipes.

Mr. G. E. THORPE, Stores Clerk, Leicester, was presented with a travelling rug on the occasion of his transfer to fill a similar position at Bradford.

Mr. G. VICKERMAN, Stores Clerk, Bradford, has been transferred to Leicester as Stores Clerk.

Mr. P. SMITH, jun., Contract Officer, Greenock, has been transferred to act in a similar capacity in the Company's Aberdeen district.

Mr. DOUGLAS FOWLER, Engineer, Kilmarnock, was made the recipient of a travelling trunk and a pipe on the occasion of his resigning the Company's service to take up a telephone appointment in Persia. The presentation was made by Mr. McDonald on Dec. 16 in the Ossington Tea Room and a social evening was afterwards spent.

Chief Inspector A. READ, Chatham, has been transferred in a similar capacity to Hastings.

Mr. P. SANDOM, Chief Inspector, Hastings, was presented on Dec. 23 by the staff with a pair of gold links and briar pipe and pouch, as a small token of esteem on his leaving the Company's service. The presentation was made by Mr. E. Armstrong (Local Manager).

Mr. A. G. SUGGARS, Measured Rate Fees Clerk, Norwich, is also a trooper in the King's Own Royal Regiment Norfolk Yeomanry, and has just won the following prizes:—Third prize, miniature rifle range shooting (scoring 58 out of a possible 60); fifth prize, open range shooting, 300, 500 and 600 yards ranges (scoring 27 out of a possible 28 at the 500 yards range).

Miss BELLA MOIR, Operator, Peebles Exchange, has been promoted to the post of Travelling Supervisor for the Border district.

Mr. R. MESSER, Fee Clerk, Galashiels, has been transferred to Kilmarnock as Measured Rate Clerk. Before leaving he was presented by the staff with an American trunk. Mr. H. G. McFarlane, District Manager, made the presentation.

Mr. CHARLES T. NEWETT, Foreman, Rochdale, resigned on Nov. 27. Prior to his departure to Canada, he was the recipient of a handsome toilet outfit subscribed for by the staff, who gave him a hearty send-off.

Miss MARY HALL, Measured Rate Ticket Clerk, district office, on resigning the Company's service was presented with a dressing case and purse as a mark of esteem from her colleagues.

Mr. GEORGE HUNTER, Outstandings Department, Glasgow, was, on the occasion of his leaving the service, presented by his colleagues with a kit bag. Mr. Anderson, Outstandings Clerk, made the presentation, and Mr. Hunter suitably replied.

Metropolitan Staff Alterations:

Mr. W. V. PEGDEN, Apprentice, has been appointed Inspector, Paddington.

Mr. F. L. GLASS, Inspector, Birmingham, has been transferred to Dalston.

Mr. E. J. D'AUTHREAU, Local Engineer, North, has been transferred to City in a similar position.

Mr. C. G. SLEIGH, Local Engineer, City, has been transferred as Local Engineer to North.

Mr. R. A. COLLETT, Temporary Clerk, Salisbury House, has been appointed Engineer's Clerk, Hop.

London Traffic Department:

Miss ANNIE AMBRIDGE has been transferred from the Complaints Office as Clerk in the Examining Matron's Office, in place of Miss FLORENCE REID, transferred to the Trunk Fee Department of the Metropolitan Office.

Miss ANNETTE SAYER, Supervisor-in-Charge, Enfield, has been promoted to be Senior Supervisor-in-Charge.

Miss CHRISSIE THORNTON, Operator, North Exchange, has had to resign on account of ill-health. She has been a very popular operator, and in testimony of this was presented on leaving by her colleagues with a gold brooch and an autograph album. They wish her a speedy return to her work with renewed health.

MARRIAGES.

Miss BEATRICE FOSTER, Post Office Fees Clerk, Manchester, who resigned on Jan. 14 to be married, was presented with a tea service by her colleagues and friends in the district office, as a token of esteem.

Mr. C. R. DOWNEY was the recipient on Nov. 23 of a presentation contributed to by the whole of the Exeter staff, to mark the occasion of his marriage.

Miss MABEL PIERCE, operator, Brighton, on resigning to be married was presented with a travelling bag by the operating staff.

Miss MARY BOARDMAN, Senior Operator, Rusholme, was presented with a handsome pair of ornaments, a fruit basket, a cushion and numerous other things by the staff, upon her resignation on account of her approaching marriage.

Mr. ALBERT G. MATTHEWS, Contract Officer, Maidenhead, was presented by the Maidenhead and Windsor staffs with a handsome black marble clock, suitably inscribed, on the occasion of his marriage.

Miss M. EDMOND, Hillhead Exchange, Glasgow, left the service on Dec. 23 to be married, and was presented by the Exchange Manager on behalf of the Hillhead staff with a silver-backed hair brush and hand mirror. Afterwards the operators held a social, and finished up with a whist drive. Mr. Carter, Exchange Manager, giving a prize for the winner.

OBITUARY.

We regret to announce the death on Dec. 21, from pneumonia, after only one week's illness, of Mr. W. J. DAWSON, who for the last ten years had been a member of the Cable Department in the Engineer-in-Chief's staff. Mr. Dawson, by his unassuming and kindly manner, had endeared himself not only to his immediate colleagues but to a very large circle of friends in the Company's Metropolitan and Provincial staffs. The funeral service (choral) was held on Dec. 24, at Christ Church, Chelsea, of which Mr. Dawson had been an active member till the time of his illness, and the interment at Brompton Cemetery. The funeral was attended by Messrs. Gill, Dudley Stuart and a considerable following of the Head Office and Metropolitan staffs.

Floral tributes were sent by the Engineer-in-Chief's Department, Mr. Dawson's colleagues in the Cable Department, the City jointers and the Western Engineer's Department.

We regret also to record the death of Foreman Faultsman ALBERT BOOKER, Portsmouth, who died of typhoid fever and bronchitis on Jan. 12, after a short illness of about three weeks. Deceased joined the Company in 1902. He was a good zealous worker and respected by all who came in contact with him.

CELERITY.

FOR election purposes, an order was signed by the Maidenhead Constitutional Club at 2 p.m. on Jan. 20. Despite the fact that no gang was working within miles of the town, the line was connected by the wayleave officer, faultsman and storekeeper, and was working by four o'clock the same day.

STAFF GATHERINGS AND SPORTS.

Edinburgh.—A football club has been formed among the staff at Edinburgh, and seems to have filled a felt want amongst the athletes of the district, as the idea has been taken up enthusiastically and the club already numbers 40 members. The secretary, Mr. G. R. Scott (Contract Department), will be pleased to hear from any other Scottish district having a club to arrange for a holiday fixture.

Nottingham Factory.—The annual dinner of the Sundry Instruments Department took place at the Welbeck Hotel on Dec. 17. After dinner a first-class musical programme was proceeded with, and fully appreciated by the staff present. Mr. Chadwick occupied the chair, and the various toasts were heartily responded to. The programme finished promptly at 12 p.m.

Reading.—On Nov. 17 the Thames Valley district staff held a whist drive in the Talbot Café, Reading. The attendance numbered about 170, and included representatives of the Post Office and the Great Western Railway Signal Department. The prizes were presented at the end of the evening by Mrs. Hives. It was regretted that Mr. and Mrs. Maclean were unable to be present owing to a family bereavement. The evening was thoroughly enjoyed, and the proceeds of the "drive," which amounted to about £1 5s., were handed over to the Children's Holiday Fund.

Southampton.—A very pleasant social evening was spent by the members of the staff and their friends to the number of nearly 70 at the Waterloo Rooms, Southampton, on the evening of Jan. 12.

Oldham.—A very successful whist drive and dance was held at the Café Monico, Oldham, on Nov. 24. All the arrangements, which were in the hands of Miss Turner and Mr. Bowes, were very satisfactorily carried out.

Maidstone.—A football match was played at Maidstone on Dec. 11 between teams representing Maidstone and Tunbridge Wells staffs. The ground was on the heavy side, but in spite of this a thoroughly interesting and strenuous game was witnessed. The home team scored late in the second half, and this proved to be the only goal obtained. The visitors were entertained to tea, after which the District Manager, Mr. S. C. Smith, presided at an enjoyable concert, for which an excellent programme had been arranged. A feature of the evening was the "metaphone" song, specially written for the occasion.

Hamilton.—The staff held their first "at home" on Dec. 17 in the Masonic Hall, Hamilton. Mr. J. T. Whitelaw, District Manager, occupied the chair, and was accompanied by Mr. J. D. Macleod, Electrician. In the course of a few remarks the District Manager gave a rough outline of the Company's progress in the district, which reflected great credit on all departments. The programme was ably sustained by Mrs. J. Martin, Miss C. P. Morton, Mr. J. MacHale, Mr. T. Edmiston and Mr. R. J. Cunninghame, and the Bellshill Sketch Party presented two sketches, the accompaniments being acceptably provided by Miss MacLachlan. At the dance which followed Mr. Cunninghame, the M.C., was ably supported by Mr. T. Armstrong. The function was crowned with much success, thanks to the efforts of the energetic committee.

Bolton.—The Bolton operators again organised a doll club for the benefit of the crippled children's Christmas treat at Queen Street Mission. Their efforts were very successful, and three dozen beautifully dressed dolls, together with toys and cash, were handed over. Mrs. Haley, who took a great interest in the club, received a letter of thanks from the Superintendent of the Mission, in which mention was made of the great delight the children displayed on receiving their gifts.

In order to assist the operators' doll club the male staff formed a football team, and arranged a match with a local team; about 200 tickets were sold. A strenuous game resulted in a win for the National by five goals to three.

Following the effort of the operators on behalf of the Queen Street Mission poor children's Christmas treat, a social gathering took place on Dec. 29 at the Central Hall. The Wilson Concert Party and members of the staff contributed items to an excellent programme, which was supplemented by dances and games. During the refreshment interval Mr. A. C. Haley, District Manager, who was accompanied by Mrs. Haley, thanked all concerned for their efforts, and stated that the gifts were actually being distributed at the Mission whilst the staff were enjoying the social gathering at the Central Hall.

NATIONAL TELEPHONE PROGRESS.

EXCHANGES have been opened during the past month at Lostwithiel (Cornwall) in the Plymouth district, and at Catton (Norfolk) in the Norwich district, making a total of 1,566 now working.

There was a net increase of 3,609 telephone stations during December, making a grand total of 503,637.

Birmingham District.—East Exchange.—The order has been placed with the Western Electric Company for the supply and installation of a common battery No. 10 equipment for 580 lines in a specially designed building, which is now in course of erection.

North Exchange.—The order has been placed with the Western Electric Company for the supply and installation of a common battery No. 1 equipment for 690 lines in a building which is now being adapted for a telephone exchange.

Streatham Exchange.—The common battery No. 1 equipment for 1,500 lines, which has been installed in a new specially designed building, was brought into use on Jan. 22.

Bank Exchange, Liverpool, was opened on Dec. 11 and not Dec. 12, as stated in our January issue.

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TELEPHONE MEN.

XLVI.—FRANCIS COWLEY.

FRANCIS COWLEY was born at Brighton and educated at Brighton Grammar School. In December, 1874, he was so successful in his examination, passing the Cambridge examination first class in honours, and receiving both the directors' and headmaster's special prizes and a prize from the Sussex Board for local examinations for general proficiency, that he had hopes of following a scholastic career. Other counsels however prevailed much to his and the headmaster's regret. He subsequently attended classes at the School of Science and Art, passing in the first class in electricity and magnetism, acoustics, light and heat and theoretical mechanics, in connection with which was awarded the Queen's prize by the Committee of Council of Education.

Mr. Cowley's first practical acquaintance with electrical work began when he became a "premium pupil" in the firm of M. Volk & Co., electrical engineers, Brighton, where he went through a practical training at the bench and later on was in part charge under Mr. Volk of the electric lighting installation at the Brighton Pavilion. This, as is generally known, was once a royal palace, the spacious interior of which and the large Oriental chandeliers lent themselves in a special way to the new mode of lighting—as it then was. It was the first public building in the United Kingdom to be electrically lit and the only other place so lighted in Brighton at the time was Mr. Volk's residence. The current in this case was generated at his own works, the gas engine used for driving the lathes being utilised also for driving the dynamo. Messrs. Volk also shortly afterwards built the first electric "railway" in Great Britain on the Brighton seashore. This was Mr. Cowley's first and only practical acquaintance with electric tramway work. The short line in question was the second in the United Kingdom, the first being that at Portrush in the North of Ireland, on which, however, electricity subsequently gave place to steam (reverting much later on to electricity), but the Brighton line has continued to be electrically worked all through, and has since been extended to Rottingdean.

The Brighton Exhibition of 1881 introduced the telephone for the first time into the town and one of its results was that Mr. Volk became agent for the United Telephone Company, and by this means Mr. Cowley entered the telephone service. The first private telephone was that put up between Mr. Volk's works and residence, and the instruments for the first rented telephone line on the south coast were fitted by Mr. Cowley shortly afterwards—in the early part of 1882 it is believed. The first telephone exchange on the south coast was opened in West Street, Brighton, not very long after, under Mr. Volk's agency. In the South of England Telephone Company was formed and took over the district from the United Telephone Company, and a few years after on Mr. Volk's relinquishing the agency, Mr. Cowley was appointed Manager. Whilst he was with Mr. Volk that gentleman's firm manufactured, in addition to torpedoes for foreign governments, etc., Blake switchbells, indicator boards and "slipper spring" boards for the United Telephone Company, amongst other things. When the National Telephone Company absorbed the South of England Company Mr. Cowley was appointed District Manager for the Sussex and Kent district, which included parts of Hampshire, Surrey and Middlesex, and extended from Aldershot and Staines on the west to Dover and Ramsgate on the east. There were nine sets of books and returns for the district in those days.

Whilst with the South of England Telephone Company Mr. Cowley was sent to Glasgow to inspect the working of the multiple switchboard there and as a result the new system of working was shortly afterwards introduced into the Brighton Central Exchange. Another result of that visit was the introduction of channel iron arms for outside roof poles and it is claimed that Brighton adopted generally the Glasgow method of outside construction

considerably before London or any other southern district. At that time the standards only carried a single line of wires on shackles attached to short clips. Later on Mr. Cowley was sent to Sheffield to inspect the underground work, and it is believed that the first length of underground on the south coast was laid shortly afterwards on a section of the route between the Hastings and St. Leonards' Exchanges.

In 1896 Mr. Cowley left Brighton to take up a position on the Head Office audit staff and subsequently succeeded Mr. Hare in that department. In 1900 he was appointed Assistant Superintendent for the North-Western Province, and spent under Mr. Claxton nearly three profitable and happy years. In August, 1902, Mr. Cowley was appointed to his present position, that of Superintendent for Ireland, on Mr. Gill's promotion to the position of Engineer-in-Chief.

Mr. Cowley, apart from the Company's business, has very catholic tastes, taking an interest in most things. If he can be said to have any particular hobbies they are general reading, music, photography and gardening. Whilst fond of outdoor life Mr. Cowley is not a "sportsman" in the usual sense, though he was very fond in his younger days of swimming, boating, gymnastics and mountaineering (crag climbing). He was especially keen on the latter, visiting chiefly the Cumberland district and accomplishing most of the well-known climbs there at one vacation or another. He has not so far taken the "golf fever" but likes the game in a mild way and would probably take to it, if only for the exercise, if he had more leisure—an attitude which perhaps serious golfers will take exception to.

NATIONAL TELEPHONE PROGRESS.

DURING the month exchanges have been opened at Southam (Warwickshire) in the South Midland district and at Merstham (Surrey) in the London district, making a total now working of 1,568. There was a net increase of 2,448 new stations in January, with a grand total of 506,091.

METROPOLITAN DISTRICT.—*Lee Green Exchange.*—The No. 1 central battery equipment for 1,300 lines which has been installed in a new building specially designed for a telephone exchange was brought into use on Feb. 5.

It is regretted that the equipment of Streatham Exchange was given last month as 1,500 subscribers' lines. The correct number is 1,730.

THE NATIONAL TELEPHONE STAFF BENEVOLENT SOCIETY, LONDON.

THE following grants were made during the month of January, 1910:—

	£	s.	d.
Engineers' Department (four grants)	10	1	6
Stores Department (one grant)	1	13	0
Workshops (one grant)	3	0	0
Maintenance Department (one grant)	2	10	0

Total number of grants made since society started—232, value £690 4*s.* 4*d.*

Donations received, £18 2*s.* 1*d.*

Number of members at end of January, 2,694.

The annual general meeting of the society was held at 58-9 London Wall, E.C., on Jan. 24, when the statement of accounts for 1909 was passed. The number of grants made during 1909 was 95, and the amount distributed, £278 13*s.* 11*d.* Mr. R. J. Payne, who has been president since the formation of the society, retired from that office, and Mr. C. B. Clay was elected to fill the vacancy.

Dr.

	£	s.	d.
Balance brought forward	147	0	11
Receipts (Donations) ..	143	2	10
Subscriptions	125	14	3
Entrance Fees	5	1	3
Cards			3
Interest on Trustees' Deposit Account ..	2	8	4
	£423	7	10

Cr.

	£	s.	d.	£	s.	d.
Grants.						
Engineer's Department ..	95	11	3			
Traffic ..	40	10	5			
Maintenance	48	7	3			
Metropolitan Office ..	24	5	0			
Workshops ..	22	15	0			
Head Office..	19	15	0			
Contract Department ..	10	0	0			
Construction	8	10	0			
				278	13	11
Printing				1	9	0
Salaries				18	5	0
Sundry Expenses				3	15	8
Balance				121	4	3
				£423	7	10

THE IMPORTANCE OF DETAIL IN TELEPHONE WORK.

BY F. G. C. BALDWIN, A.M.I.E.E., *Assistant Metropolitan Engineer.*

THERE exists an old saying that a thing worth doing at all is worth doing well, and, undoubtedly, the fact that Englishmen have carried this maxim into practice in the past has done much towards securing for them the enviable reputation they possess in the manufacturing field to-day.

Throughout the world the British workman has always been, and still is, characterised by the excellence of his work, but owing to keenness of competition and consequent cutting of prices the cheese-paring policies which masquerade under the garb of economy, and which all true economists would designate false, it is feared that at the present time there exists a very serious tendency to underestimate the value of good and sound workmanship. If this is so, the reputation of the British workman is imperilled, and, for individual and national interests, he should look to it that that reputation which has been built up by his forefathers remains unsullied.

The writer's interest in this matter of the importance of good workmanship was intensified by a remark made by the Engineer-in-Chief, Mr. Gill, in the course of his lecture on "Standardisation" to the Traffic branch of the Telephone Society of London on Oct. 18, 1909. The remark referred to was to the effect that we ought to be thoroughly ashamed of ourselves if we turn out a slipshod piece of work. It is with the idea of emphasising the great importance of the attainment of a high standard of workmanship, especially in detail, in all branches of the telephone business, and particularly on the practical side, that this short article has been written.

The electrical profession, more particularly in its earlier stages, has suffered, perhaps more than any other, from the effects of bad workmanship. This may have been, and probably was, quite excusable, being due more to an unavoidable lack of knowledge of the subject and to inexperience of the exigencies of such a young but vigorous business, than to neglect or indifference.

To-day, however, quite different conditions exist. The very rapid advances which have been made in the knowledge and science of telephony since the introduction of the telephone as a business commodity, have unquestionably revolutionised the circumstances under which work is carried out. As the result of investigation and experience during the past few years, there is now at the disposal of the telephone engineer an invaluable fund of information which, if wisely applied in practice, should preclude all possibility of the admission of slipshod methods and inefficient workmanship.

There appear to be two chief causes of bad work, indifference and ignorance. With the first of these no sympathy can justly be expressed. The man who is indifferent or careless as to the quality of the work which he turns out, may well be referred to an old Latin saying—*Ne tentes, aut perfice*: "Attempt not or accomplish thoroughly." The avoidance of a state of ignorance is within the reach of everyone. The educational facilities which abound in all branches of the telephone business are now such as to enable the intending telephone engineer, by dint of perseverance, to obtain a knowledge of his subject all-sufficient for his purpose, and this knowledge supplemented by experience should inspire a worthy detestation of inferior work. Knowledge, however, is of little or no service unless applied to the purpose for which it is gained.

A telephone system is built up of a multiplicity of details, and it may be truly said that no other section of the electrical profession depends so essentially upon the excellency of its detail work for the achievement of success. Since good workmanship is absolutely dependent on the attention given to minutest detail, it follows that the very complexity of detail which obtains in any telephone system, whether it be in traffic, electrical or engineering matters, demands the very best workmanship to secure the best results.

During the consideration of this article, the writer's attention was arrested by some remarks on the importance of detail made by Mr. J. H. Rider, Chief Electrical Engineer to the London County Council Tramways, during his address at the opening sessional meeting of the students' section of the Institution of Electrical Engineers on Nov. 17, 1909. Mr. Rider remarked at the outset (quoting from *Electrical Engineering*, Nov. 25, 1909): "Attention to detail frequently meant all the difference not only between success or failure, but between safety and danger," and in conclusion, "While a good engineer was always characterised by a keen attention to matters of detail, it by no means followed that a man who watched trifles was necessarily a good engineer; the engineer should cultivate strongly a proper sense of proportion. The skill of the engineer was shown by his ability to distinguish between what was necessary and what was not. But when it was decided what was necessary, its details should have all the care and attention which it was possible to give."

In the telephone business ths value of good work—good detail work—cannot be over-estimated. The interests of the individual and of the community in the provision of an efficient telephone service can only be properly served by attention to detail. In the departments dealing with the technical side of telephony, especially, it may be truly said that the manner in which detail is respected makes or mars the whole.

It has been argued that attention to detail is not an essential, and that as long as a thing works well everything is all right. But, in this present day of progress, emphatically this is not so. The immediate purpose may certainly be served by an inferior piece of work, but if detail has not received the attention merited, the probability is that a needless waste of both time and material occurs and, owing to the indifferent workmanship, many things inevitably conspire successfully to its undoing, with the result that the work fails prematurely. In addition to the mere failure of the work, which is in itself unsatisfactory, there follows an increased cost in maintenance, which would have been avoided had a better state of things prevailed.

Although it may be said of certain works occurring in telephone engineering that they are satisfactory in so far as soundness and efficiency are concerned, yet it is possible they may lack that perfection of arrangement, that accuracy of adjustment, that degree of finish which gives a job a workmanlike and pleasing appearance, which appeals so much to the man with an eye to symmetry and a love for well-finished work. Provided that this finish is carried out with intelligence, there should be little, if any, extra cost incurred. It is difficult to put down in black and white any material advantage in favour of the well-finished work. Yet, perfection of execution in any job of whatsoever kind bestows a moral benefit upon both the worker and the onlooker, and also sets an example to the less experienced workman. Moreover, the care and attention necessary in bestowing a judicious finish serves as security against weak construction. As to how far this principle of finish should be taken must depend entirely upon the good judgment of the engineer. The average Englishman is essentially practical, and he has never advocated the over-adornment of his handiwork. He executes his work to fulfil a certain purpose, and, not being an artist, contentedly declines to heap upon it an abundance of ornamentation. It is obviously possible, although just as obviously ridiculous, and far removed from economy, to attempt such excessive finish in all telephone work, but there is a certain indefinable reasonable finish which is apparent to the trained and thoughtful man, who executes his work accordingly. The danger of drifting into an untidy and imperfect state of completion which might eventually lead to inferior practice exists, and should be guarded against.

Good work has an immediate and a lasting result. Emerson has said "The reward of a thing well done is to have done it." Every man has experienced that glow of satisfaction with which he regards his well-finished handiwork, and the pleasure and freedom with which his after leisure is enjoyed is in itself a prize easily attainable. This self-satisfaction, although it may appear a somewhat phantasmagorial reward, is the immediate result of good work, and is not to be despised. Moreover, a thing well done brings satisfaction to others, and herein lies the value which, in the selfishness of his heart, the worker most appreciates, namely, the approval of his chief—often, it must be admitted, eloquently expressed in silence—which the telephone man has already learnt to accept as approbation.

The vagaries of telephone work and the consequent lines of thought necessary to cope therewith are manifold, as surely every telephone man must know. Hence all the more reason for that attention to detail in both design and execution, that exercise of careful thought and consideration so essential to success in the important and indispensable service of the telephone.

MAINTENANCE ORGANISATION.

By EDWIN GASKELL, *Nottingham.*

THE storm of Dec. 3 was naturally a trying time for our maintenance staff, and every district throughout the country is now looking back with feelings of satisfaction or otherwise on a circumstance which, fortunately, we have not often to cope with. Never as at such times as these is the Company's reputation more at stake or the opportunity for the triumph of organisation greater, and this as much in the public commercial interest as for our own self-respect and the substantiation of Contract Department lore. A word, therefore, on the subject of maintenance organisation may not perhaps be without interest.

The necessity of not being caught napping by these sudden devastations would point to the desirability of including provision for such emergencies in the ordinary routine, so that on arising they cease to be emergencies. The following suggestion may be a step towards this end:—

The secret of the reliability of the fault card system of maintenance is that it is really reproducing in miniature the Company's system. Each card has identity, it represents a subscriber and the plant for whose maintenance the Company is responsible. In dealing with a fault, the subscriber's card is taken from the cabinet, and details of the trouble entered thereon, and the card then becomes materially and tangibly representative of what exists in reality. In the same way each compartment of the distributor represents a man, and when an inspector is given a fault to clear we reproduce the action by placing the card in the distributor. All this leaves no room for error or oversight, and we find the weakest link in the maintenance chain to be in directing the movements of the men, for it is here that we depart from the stereotyped. With a number of men engaged in breakdown work, and scattered over a big area, it is not an easy matter to keep the comprehensive grip of the location and progress of each one of them so necessary to expeditious working, and this more so if one is not familiar with the identity of the additional emergency staff. If we could apply the principle of the fault card system to the *movements* of the men, we should have the same mechanical accuracy. This is accomplished by having a map, mounted on wood or cardboard, of the district under consideration, with all tram routes and railways clearly shown, and cuttings from a time table showing times of *departure* gummed on the respective sides of the route stations referring to up or down traffic. To each man is allotted a number (not necessarily known to the man) which is recorded in a table, and his location is represented on the map by a pin bearing his number. The colourings of the pin heads are distinctive, white betokening individual linesmen, and black (bearing the foreman's number), a gang. On a linesman or gangs being told off to clear a certain fault, the corresponding pin is moved to the spot in question, and that is regarded as the location of the linesman or gang until the trouble is reported clear. Thus, at a glance, the position of the men at any time and their means of transit may be seen and their efforts directed to the best advantage. By this means also, the size of the staff which one man can direct is very much increased, a thing of paramount importance when it is remembered that the directing of the staff is best handled by one man only. By arranging the cards in groups in accordance with the location of the subscribers, the distribution of faults to the staff is very greatly facilitated.

POWER SUPPLY AT SMALL EXCHANGES.

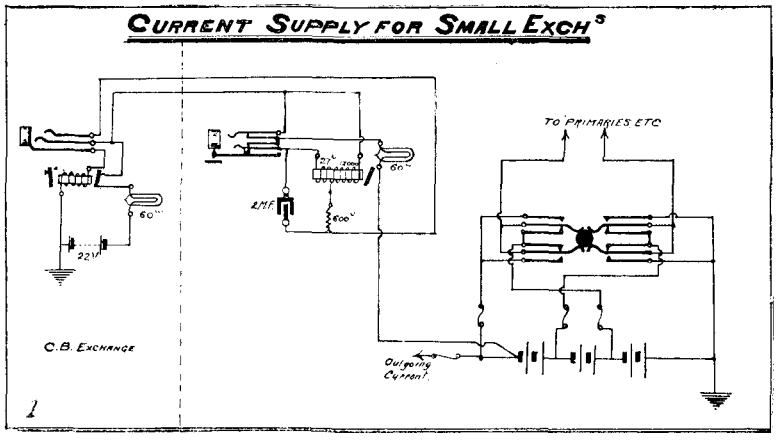
By P. T. WOOD, *London.*

THIS subject has been of increasing interest since the advent of the central battery exchanges, because it is now possible to make use of the central battery for lending purposes, and thus effect economies both in material and labour.

In earlier days dry cells were employed at the small exchanges, but renewal charges were heavy, and though Daniell's gravity cells would have been less costly to maintain, the use of these has never found favour in London. In Liverpool ten years ago this type of cell was used universally for small exchanges, and the dirty job of cleaning zincs and renewing copper sulphate at Old Swan, Sefton Park, and other such district exchanges is well remembered by the writer.

The use of accumulators is now becoming general, but up to recent times—in London, at any rate—the general practice has been to send these periodically to a central battery exchange in the particular district, and charge them from the main battery. This method is in many ways convenient, but cartage costs are heavy, and the deterioration of cells under such rough usage rapid.

A suggestion originating, so far as London is concerned, with Mr. Blight, the then Divisional Maintenance Electrician for the Eastern district, has so well met the somewhat opposing requisites of efficiency and economy that the idea is being adopted throughout



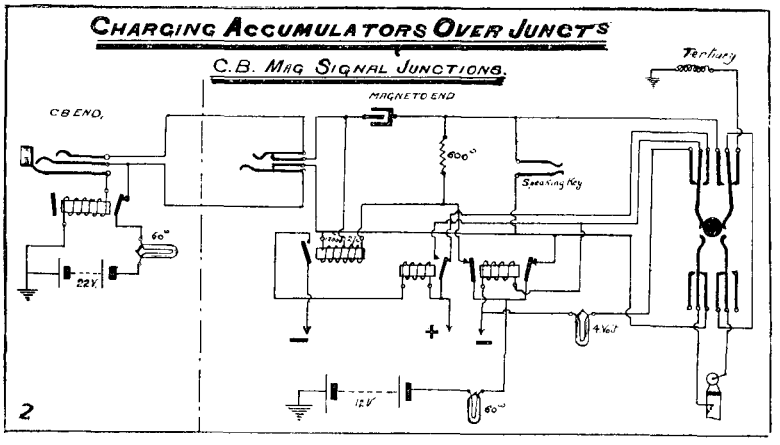
London with a very considerable resultant saving. Various modifications have been made from time to time to adapt the arrangement to differing conditions, and a few words on the subject will no doubt be of interest to provincial readers of this JOURNAL.

Fig. 1 represents the outlines of the circuit in question where small accumulators at a sub-exchange (in this case a 100-line dry-core magneto switchboard) are charged over junction lines from the nearest central battery exchange. When the junction is not in use for ordinary purposes current is supplied over the B line, a 60-ohm lamp being inserted at each end to prevent trouble due to an earth.

When the line is picked up at the central battery end, the charging current is automatically cut off by the action of the relay in the third conductor circuit. At the distant end six accumulators, divided into three sets of two, are used for the primary circuits, visuals, test engaged, etc. They are therefore charged in series and discharged independently. An interesting point to note about this and similar circuits is the use made of the 12-volt battery to effect the calling. When the distant central battery operator takes the line her battery is in opposition to that of the sub-exchange, consequently very little current will pass through the 12,000-ohm winding of the calling relay, hardly sufficient to pull up the armature. Owing, however, to the bridge on the inner contacts of the line jack, the 12-volt battery can now obtain a circuit through the 27-ohm coil to the A line, and thence to E. This actuates the relay until the 12-volt battery is cut off by the insertion of the plug into answering jack, when both coils of the calling relay come into normal operation.

An idea of the saving effected in those London exchanges where dry cells were in use will be seen from the following:—

Taking into account the number of dry cells required per annum, plus the cost of changing these, and adding the cost of cartage, the annual charge was found to vary from about 30*s.* in the small exchanges to £11 in the larger. The average is about £7. The annual capital charge on fitting the necessary accumulators at each exchange may be taken as 13*s.* The cost of current supplied, of course, varies, but in a typical case recently worked out where the power is supplied over the junctions to a 12-volt battery which



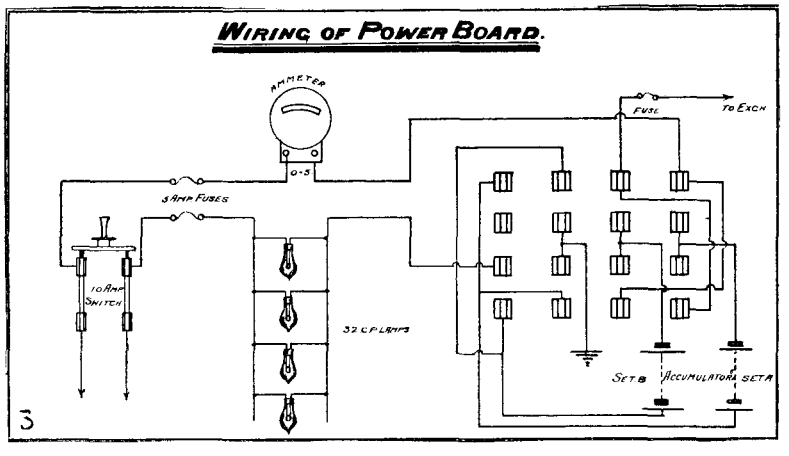
is discharged in three 4-volt sections, the current used was as follows:—

Input to cells per week	...	14 ampere-hours.
Total input available for discharge, 14 × 3	...	42 ,, ,,
Normal output	... ...	30 ,, ,,

Estimating an efficiency of 80 per cent., the input exceeded the output by 3·6 ampere-hours. The cost of this supply worked out at just over 2*d.* per week.

The use of a 4-volt battery may seem to be a reversion to an obsolete and undesirable method, but in this case the advantages warrant its adoption. Briefly, the facts are these:

Almost half the total energy is supplied to the operators'



instruments, and 4 volts is the suitable voltage for these circuits, any higher voltage resulting in wasted energy in resistance spools, as the current must not vary to any extent. In the lamp circuits also the increase in voltage is not compensated by a corresponding drop in current—*e.g.*, the energy required for a 12-volt lamp is greater than that for a 4-volt lamp. Finally, twice as many cells would be required in the 12-volt method if an adequate stand-by is to be fitted.

In calculating the current required at or available for any small exchange, the following information is obtained, and used as the basis for calculations:—

1. The number of junctions available for charging purposes and loop resistance of each.

2. The type of junction; order wire or signalling. (In the case of an order wire junction, both A and B lines may be used for current supply.)
3. Estimated time per week during which the junctions are disengaged.

From these particulars can be obtained the weekly input to the cells. Taking the case previously mentioned. The normal current supplied with all junctions disengaged

$$= \frac{E}{R} = \frac{22 - 12}{100} = \cdot 1 \text{ ampere,}$$

R being the combined resistance of the junction lines available. The number of hours per week the cells are under charge is 140, so that the total input of 14 ampere-hours per week is obtained. The weekly discharge on the sub-exchange battery is obtained either by calculation or by taking readings over a period.

Where portable accumulators are kept at exchanges and sent in periodically to a local centre for charging, the saving effected by the new method is greater, being nearly in proportion to the current consumed. The cost of the old method is made up of the items—energy, cartage, handling and repairs to cells. At one exchange, of which particulars are available, the annual charge under these heads amounted to £23; by adopting the method of charging over junctions this amount is reduced by 90 per cent.

Fig. 2 shows the connections of a signal junction terminating on a short-circuit junction position, and arranged for automatic calling and clearing.

Another method which has been utilised in cases where charging over the junctions is not practicable is to charge through lamps from the supply mains. Fig. 3 represents such a circuit installed five years ago at an outlying exchange. The current was supplied at power rates. The cost worked out at 6*s*. 8*d*. per week, an expensive item in this case, neither the heat nor the light of the resistance lamps being utilised. A similar method that can sometimes be used is to charge cells in series with the ringing motor. The charging current is small, and the hours during which the machine runs comparatively few, so that an additional charge has to be periodically arranged.

The method of charging over junctions has been extended with excellent results to certain large private branch exchanges, where the use of power leads is not economically possible. The B line of each exchange line is taken through the exchange line jack to the private branch exchange local battery of seven cells. The cells are thus under continual charge so long as the exchange lines are idle, and until the subscriber's operator plugs into the line jack. In the case of Whiteley's, the universal providers, all of the 30 exchange lines are used for this purpose, the seven-cell battery being joined to the inner B spring of each exchange line jack through a suitable resistance. This method has also been employed with advantage to charge private branch exchanges fitted with dry cells! I am informed that their useful life is increased three-fold by this means.

NOTTINGHAM FACTORY AND CHARITY.

THE sum of £100 has been subscribed by the Nottingham factory employees during the year ending Dec. 31, 1909, and in accordance with the usual custom this sum has been distributed amongst various local charities, as follows:—

	£	s.	d.
General hospital	47	4	0
General dispensary	10	15	0
Nottingham and Notts convalescent homes	9	0	0
Nottingham and Notts Association for the Prevention of Consumption	7	7	0
Children's hospital	5	15	0
Eye infirmary	5	5	0
Nottingham and Notts Nursing Association	3	16	6
Women's hospital	3	0	0
Throat, ear and nose hospital	2	15	0
Samaritan hospital for women	2	12	6
Sisters of Nazareth	2	10	0
	£100	0	0

During the past ten years local institutions have benefited to the extent of £628 through the medium of this fund.

TELEPHONING FROM MOVING TRAINS.

REFERENCE is frequently made in American electrical papers to the use of the telephone in connection with railway working. One of the latest applications of this branch of telephony is an invention of Mr. F. Lacroix of the Electrical Automatic Railroad Safety Signal Company, which not only enables the engine driver to talk from his engine whilst in motion to the officials at the railway station, to any other train along the line, or by connection with a switchboard at the station to any ordinary telephone subscriber, but it also warns the engine driver of the presence of another train in the same "block" and automatically stops both trains. The arrangement is described in the *Telephone Engineer* (Chicago) as follows:—

"The method of operating is this: Stretched along the right-hand track, on small supports, is a stout steel tape. This carries ten volts of electricity, not enough to be harmful, but enough to supply all the current needed. At intervals wires run from this tape to the telephone and telegraph lines at the edge of the right-of-way. Below the engine cab is a set of wire brushes which rub along the tape and keep in constant contact with it.

"The telephoning part is simple. The engineer merely plugs in, his telephone apparatus is thereby connected with an operator at division headquarters, who gives him the station he wants, or any other train along the line, or any private telephone he wants to reach that can be connected with the line.

"The automatic train-stopping apparatus is much more complicated. It consists of an arrangement whereby, if two trains get upon the same 'section' of tape, say within two miles of each other, a certain circuit is broken in the cabs, a lever is released, and the air rushes into the brakes at all the wheels. At the same time a little green incandescent light, which burns at all times when the track is clear, goes out like a switchboard pilot lamp.

"An unofficial test, for the benefit of the Press, held on the one-track Erie line between Newark and Nutley, was a perfect success. Not only was the telephone audible from train to train, but from train to station and from train to New York.

"Only a slight rumbling sound made the New York call different from any other telephone call. The train on which the newspaper men rode was stopped automatically near Nutley by the presence of another train upon the same track a mile and a half away, without any aid from the engineer.

"The circuit for the telephone was formed through a specially constructed third rail alongside the track. A battery worked the track relay and a dynamo on the locomotive also furnished current. The third rail was connected with the wires of the telephone system at various stations along the road, and the method used in telephoning from the train was to call the station master and have him make the connection.

"In the cab of a locomotive equipped with the Lacroix system is a shunt-wound dynamo, the armature of which is driven by a turbine deriving power from the boiler of the engine. The dynamo and turbine are stock machines of no special construction. In the circuit of the armature coil is an electric lamp that constantly glows while the track is clear ahead. Also in the armature circuit is an ammeter to record the time that the current through armature coil stops. In the armature coil is a magnet that controls the application of the brakes and a whistle. In the normally complete circuit of the field coils of the dynamo is a contact shoe adapted to engage with a third rail.

"The rails of the track are divided into insulated blocks. Extending along the track are conductors forming a normally incomplete circuit with terminals in each block provided with a switch which is normally held to close the terminals by a rheostat, which is in a circuit that includes the opposite rails of the block and a battery. Should the circuit through the rheostat be interrupted in any way, by a train on the rails forming part of the rheostat circuit for an instance, the rheostatat would be de-energised and the switch would open the terminals, which would break the combined track and field circuit of the dynamo. Consequently the generation of current in the armature coil would cease, which would cause a stopping of the train, a blowing of the whistle and the extinction of the signal lamp in the cab of the locomotive.

"By utilising the cab and track circuits hereinbefore referred

to a telephone equipment is provided whereby the engineer in his cab can communicate with a station agent at his station, or *vice versa*. Also by utilising the local telephone service at the station the engineer in his cab can communicate with a person at a distant point, the train despatcher for an instance, or *vice versa*.

"In the equipment of the station-house a strap-key normally closing the circuit in local conductors. Inside of the strap-key branch wires lead from these conductors to a double pole switch, which controls a circuit through the telephone. Interposed in this conductor is a magneto-bell. Across the terminals of the strap-key extends a high resistance coil.

"In the cab of the locomotive a wire extends across the leading-in wires and passes into the telephone plug-socket. Single pole switches are provided on opposite sides of the plug-socket to cut it out of the field circuit of the dynamo.

"Should the station agent for any reason desire to stop an approaching or receding train and communicate with the engineer thereon, he presses on the strap-key, which breaks the circuit through the conductors at that point. When the locomotive approaches the next third-rail section and the shoe making contact with the same in the manner described, the combined cab and track circuit being broken by the pressing down of the strap-key, the brakes will be applied to stop the train, the light on the cab will go out and the whistle blow. When the station agent opens the strap-key he also throws the switch to interpose the telephone circuit into the circuit of the conductors. When the locomotive comes to a stop, to ascertain the trouble, the engineer in his cab opens the switches, and inserts the plug of his telephone into the socket. By operating his magneto, the engineer rings the magneto-bell at the station. After communication has been established in this way, the station agent and engineer can talk to each other through their respective telephones in the usual way. The opening of the strap-key not only stops the locomotive, but while the telephoning is going on it should be held open to prevent the passage of the direct current from the dynamo, which would interfere with a proper operation of the telephone. While the opening of the strap-key will break the circuit at that point, yet for the alternating current of the magneto the high resistance coil would complete the circuit, but would prevent the passage of the direct current of the dymano. In this connection it may be said that the resistance coils across the terminals, in the track circuit, should the terminals be open, permit the passage of the alternating current of the magneto and telephone, while they prevent the passage of the direct current of the dynamo.

"Should the engineer from his cab desire to communicate by telephone with some one beyond the station-house, the train despatcher at a distant point for an instance, he directs the station-agent to connect him with the long distance circuit. This the station-agent does by inserting the plugs in the sockets and thereby connects the track circuit with the local telephone system, through which connection can be made to the distant point.

"The line construction is very light and only requires the strength of one wire for each track. The cost of construction for a double track road over that of a single track is very little.

"The size of the wires used on the full line is No. 12 hard drawn copper insulated, weather-proof wire, D. B. Iron wire can be used if necessary, the current being the fraction of an ampere.

"The third rail construction does not call for additional ties, for the bracket that holds the third rail is attached to the running rail, and in the event of ties being replaced there is no interference with the third rail. The third rail itself can be of exceedingly light weight and the current it carries is so light as to obviate all danger of injury by contact.

"The system is now installed for twelve miles on the Newark branch of the Erie Railway, from Newark to South Paterson, New Jersey, for working demonstration."

INSTITUTION OF ELECTRICAL ENGINEERS.

TRANSFERRED to Member: Mr. D. Stuart, of the Engineer-in-Chief's Office.

Elected as Associate Members: Messrs. W. Ireland and H. S. Plymen, of the Engineer-in-Chief's Office, and C. E. Tattersall, Divisional Engineer, North-East (Metropolitan).

TELEPHONE WOMEN.

LIX.—LILY SKELLAND.

MISS SKELLAND entered the Company's service at Warrington in January, 1892. At that time there were only about 56 subscribers and nine trunk lines, which were controlled by two operators. The exchange was in a room over an ironmonger's shop a few yards away from the present exchange, and service was only given during the day or business hours of the shop below.

The switchboard was equipped for 100 lines, and was fitted with the old Dewar keys and large plugs and jacks. To make a connection, one plug was taken up from the key shelf and the corresponding plug pulled down from a kind of canopy at the top of the switchboard. At this time Warrington was controlled by

LILY SKELLAND.

Liverpool, electricians being sent out from thence to clear faults and fit new instruments.

In 1893 Warrington was made a district office, the present premises were taken, and a new 150-line single-cord switchboard was fitted. Each operator's set consisted of a suspended circular Blake transmitter, double-pole receiver and one answering plug. This board soon became full, and two multiple switchboard sections were fitted. Two more have since been added and three sub-exchanges opened.

Miss Skelland was appointed Chief Operator in November, 1895. She is much interested in St. John's Ambulance Work and is a member of the Warrington Nursing Brigade, having passed the examinations and gained the St. John's Ambulance medallion. She is also very fond of reading and is a Sunday School worker.

LX.—JANET MAUD BUXTON.

JANET MAUD BUXTON entered the Company's service in September, 1898, as a Junior Operator. At that time Mr. Cook, the present Assistant Engineer-in-Chief, was manager for the Nottingham district. Miss Buxton's earlier experiences were in connection with the Derby Central Exchange, which had an earth circuit multiple indicator board on which only 350 stations were working. She was appointed Chief Operator in September, 1905. On April 16, 1906, the Company closed the old exchange and opened a new fully equipped central battery switchboard, to which

JANET MAUD BUXTON.

she then devoted her attention. During the period of Miss Buxton's service the number of subscribers at Derby has practically quadrupled. The extreme courtesy and tact which she always shows when dealing with the Company's subscribers has won their entire confidence.

She is very popular with her staff, in whom she takes a keen interest, and is a firm believer in cultivating the social side. Sept. 16 is a red-letter day in Miss Buxton's life, as on Sept. 16, 1898, she entered the service, and on Sept. 16, 1905, she was appointed Chief Operator. She has no particular hobby, but has a partiality for walking and reading.

CANVASSING ARRANGEMENTS IN GLASGOW.

AN arrangement has been come to between the Post Office and the National Telephone Company by which, in order to avoid a duplication of staff which would be rendered unneecssary in 1912, the latter will undertake all Contract Department work in the Glasgow area. Orders obtained in a Post Office sub-area will be handed over to the department to be dealt with, while orders obtained from one of the Company's sub-areas will, of course, be fulfilled by the Company. The arrangement will not only apply to exchange service, but also to private lines, sales, cessations, removals and supersessions.

SOME PHASES OF CONTRACT DEPARTMENT WORK (CHIEFLY IN RELATION TO THE PUBLIC).

BY JOHN A. CRAVEN, *Glasgow*.

MANY aspects of this subject have been portrayed; indeed one feels that here originality may be considered a coy feature, and that it will be difficult to avoid treading into footpaths, the footprints of those who have already described the work. I hope, however, that what may be regarded in some respects as "cauld kail het again," will not be wholly unpalatable. Contract Departments exist for the purpose of negotiating with the public. They act in the first instance as seminaries or places of education from which the seed is spread abroad, and this is perhaps their primary or original function. The work is, however, varied, and may be broadly arranged under three heads, viz., new business, continuations and disconnections; or these might be described as the making, the adjusting and the dissolving of contracts.

As the public will not to any great extent come into the Contract Department in search of a telephone, it is necessary that officers go out to the public. Solicitation creates the desire for telephone service. The indefatigable pushing spirit of the age has its embodiment in the canvassing staff. We find there the dogged perseverance of the wrestler alternating with the subtle skill of the angler. Officers having these inherent qualities and skilled in the necessary diplomacy, leave the precincts of the Contract Department in the morning at 9.30. The lady officers visit the houses, and the male officers the business quarters. As each one engaged in new business work is allotted a district, there is no overlapping. Occasionally a case of "poaching" does occur, but when the delinquent finds that he has to hand over the booty to the rightful owner, he sees that the game is not worth the candle. The inborn self-interest asserts itself, and the errant officer then works for his own good. However, before an officer can claim a contract procured by another officer, or by the office, he or she must be able to produce a card as evidence that the party has been called on (by the claimant). A card therefore should exist to attest all calls, as it is a case of "no card, no claim to the contract." So long as an officer works within his own territory, he has a wide range of liberty. All the contracts he gets there are lawful prizes. As he works from day to day he realises that the telephone is cosmopolitan, finding a home in all commercial and industrial undertakings and in the domestic life of the people. He sees that the growth of the telephone is as steady and marvellous as the growth of the smallest seed in the plant kingdom. Beginning its career usually as a very secondary auxiliary, the telephone almost invariably rises in importance till it becomes the hub of the undertaking, with branches to the different parts of the office, warehouse, or works. The officer observes this in his rounds, and it incites in him an insatiable desire for more contracts.

Many are the causes which rouse in people the desire for a telephone or telephone extensions. A trip to America seems to have as potent an effect as any on the mind of business men. An officer in this district related such a case the other day. He called repeatedly on a firm of warehousemen, but could not get them to extend their telephone facilities. One of the sons in the business took a run over to America—became a convert to the business methods which exist there—and declared on his return that a larger number of connections was necessary. Unfortunately, by this time the City had been divided between the National Company and the Post Office. As the premises of the firm in question are within the latter's province, the officer was obliged to allow the order to pass him, and the firm had to be content to take the additions from the Post Office.

I suppose there will be a great diversity of opinion as to which is the best part of the day to interview the prospective subscriber. Contracts have been secured at all hours, as it is usual to find that what is one man's busiest hour is another's slackest time. In cases where the party seems to be always busy a little shrewd tact is necessary in order to get an interview, if possible when the one wanted is in a good humour. A dinner lubricates business—the great Dr. Johnson said so. It is therefore desirable to interview

some people after this solace to the inner man. Then again the morning is often thought to be the best time, as the emotions are calmest and the nerves are at their steadiest at that part of the day. This surely is the reason why so many people arrange for ten o'clock when asked at what hour they desire the Company's representative to call. Whichever hour is selected, it is generally agreed that the interviewed party must have time to consider the various points connected with the contract which he is asked to sign. An officer's reputation is at stake if he loses order after order when he has got into close grips with the parties. But I think it is also at stake if he unduly hustles a man to sign a contract. From all reports *hustling methods seem to thrive in America, but they are certainly* not suited to the cool, calculating temperament of the British people. While we may say and agree that the officer should have the scent of a bloodhound for an order, and the grip of a bulldog on a prospective customer, we would also add "hasten slowly," *i.e.*, do nothing in a hurry. "Slow and steady wins the race." Satisfaction is the oil of the business machine, therefore don't risk buying or selling "a pig in a poke." A man may sign a contract without knowing all its conditions, and we may accept it from him, realising that all these conditions have not been pointed out. He has signed it, and that is enough for us. We say, that ignorance of the law excuses nobody; what is written remains as absolute evidence. Nevertheless, we feel an uncomfortable sting roused by the consciousness that the contract was not procured by industry combined with honour. I have occasionally heard ireful subscribers speaking as if they had been trapped into signing their names, and their words recall Dickens to mind when he pictures one of his characters, who says of himself: "He's hard-hearted, sir, is Joe—he's tough, sir, and de-vilish sly!" The said Joe was proud of such a reputation, but I am sure that every contract officer would disown it. Yet he is sure to get it if he sets his life or reputation upon a cast and decides to stand the hazard of the die. It is far better to be guided by Disraeli, who said: "Principle is ever my motto, not expediency." The primary conditions which should be pointed out to the prospective subscriber are these:—The necessity of giving notice to cease in writing six months prior to the due date; the liability for junction fees, stamp duty, and deposit to cover junction and trunk calls. When these are explained the officer can take the contract with a clear conscience. It is always hard to lead a man to the very point where the signature alone is necessary and to find that it is impossible to get him to sign. Realisation does not always follow expectation, and such an experience but illustrates the truth of the saying: "Ae man may tak' a horse to the water but twenty winna gar him drink." However such checks are to be reckoned with in the day's work, and the officer should rather be stimulated than discouraged by difficult situations. He presses forward to success in some other quarter, feeling, I doubt not, as the poet aptly puts it, that—

"This life's just like yon toddling burn,
Though cross crags whiles may stint it,
Comes soughing by ilk thrawest turn,
And never looks ahint it."

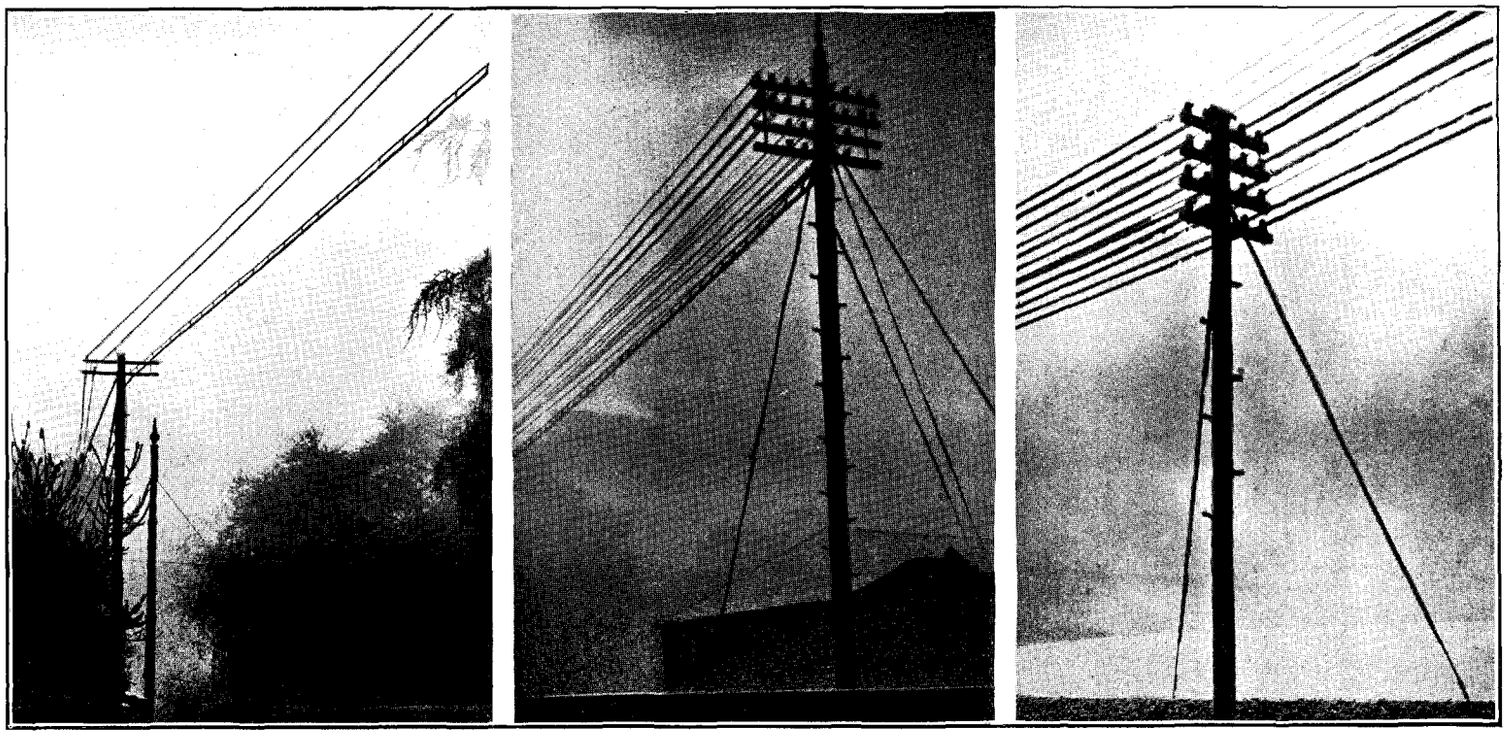
It is the virtue of a contract officer, as of a soldier not to know when he is beaten; of a general not to let others know.

The new business glides by an easy transition into ceasement work. What is new business to-day may be under the supervision of the ceasement officers a year hence. The Contract Department ever aims at increasing the new business and reducing the ceasements, so that in the monthly summary of the work done the new business may weigh down the ceasements. This monthly summary is called the 1,480 return. It mirrors forth the work sometimes perhaps more conspicuously than is pleasant to behold. But for the present we will leave this return alone, in case, as the Americans say, we get "side tracked" and neglect the ceasements. The term "ceasements" is a word which branches in three directions. It is therefore comprehensive, embracing the superseding, continuation and disconnection work. The keynote of change would seem to be its dominating factor. The uncertainty of the whirligig of life is its origin. It has indeed an ominous sound, with a blend of discontent, determination and unrest, yet I think we can extract a truer meaning and give to it a rosier complexion when we reverse the word. It now appears as "meant to cease." In the great majority of cases in the past, ceasement letters have been from those who meant to cease if unfavourable circumstances attended them when the rental due date came round. This prudent forethought will be heartily commended, especially when we find that at normal times and under normal conditions by far the larger number of these letters were withdrawn on the approach of the due date. The telephone was left for one year at least, to give to the world and take from the world that expeditious interchange of thought and sentiment which stimulate business and social life, and helps to make life worth living.

When we turn to those ceasements which come from subscribers who from different causes cannot keep the telephone any *longer we always find a large number of letters which are short of* the requisite notice. These subscribers have necessarily to continue for another year. In some cases the half-year's rental is accepted from the defaulting party, and the telephone is taken away at once. The excuses often advanced by some of these short-notice subscribers are as flimsy and varied as they are often ludicrous. For example: "I telephoned that I was giving up the telephone." "I didn't know that any notice was necessary." "I put off writing till it was too late," etc. Extenuating circumstances, however, have a sounder groundwork than procrastination and careless want of knowledge, and while failure to impress the conditions of the contract on the signatory at the beginning of the term often comes out at this stage, the most of the excuses are groundless and invalid. It is obvious that a more elaborate system is necessary for dealing with ceasements than for new business. The present practice has evolved from the less complete system of earlier days. The little flaws and deficiencies have been rectified, and the links fit into and complete the chain in such a way as to leave no room for disputing between Company and subscriber when ordinary care has been exercised. Ceasement work is arranged to meet the legal aspect of telephone contracts. The department must be able to answer two questions. Did the subscriber give notice to cease in writing? If so, was the notice in order? *i.e.*, was it given six months prior to the due date? On these two questions hang the issue. The following process is followed when a subscriber gives notice to cease:—His letter is registered in the letters received book, stamped and numbered. The particulars of the agreement with the Company are endorsed on the back of the letter by a Rental Register Department clerk. The subscriber is then advised by letter that it is in order, or not in order for his contract to cease, as the case may be. The ceasement is noted in the "notice to cease book." A card and "notice to cease" list are filled up with the name, address, rental, due date, etc. The card is placed according to the due date in the unfinished section of the ceasement cabinet, and the list is attached to the front of the papers and passed to the ceasement officers to deal with. After calling on the subscriber on the approach of his due date, the officer is in a position to say, either that he is continuing his telephone, or is ceasing it. It may be a case of "not in order," which generally means continuing, *nolens volens*. The officer notes on the notice to cease list, the result of his calls on the subscriber. The card is finished off accordingly, and filed under its due date. The entry in the "notice to cease" book is marked off. The Rental Register Department is advised of the continuations, while the disconnection orders are passed to the Works Order Department. The process is then finished so far as the Contract Department is concerned.

I should like to refer to one of the divisions of the department work which is as constant as either new business or ceasements, yet usually occupies a less noticeable position. I allude to the removals, or shifts, as we usually designate them. There is a steady run of these shifts from January to December, which is considerably augmented at the May term. The larger proportion of them are removals from one position to another in the same room, or to an adjoining apartment. While most people agree at once to the charge for these short-distance removals, it is curious to notice the very common misapprehension which subscribers have acquired regarding payment for shifts which require more work. The Company, they say, installed the telephone without making a charge, surely they can install it in the new premises as in the old without fee. When told that this cannot be done, they almost invariably reason that they can overcome the difficulty by ordering a new telephone for the new premises. Of course, when then told

FOG AND FROST IN GLASGOW, DECEMBER, 1909.



[*Photographs by M. MacLean, Glasgow.*

FIG. 1.
Showing the extra thick appearance of the two 100-lb. copper wires owing to their coating of hoar frost. They appear to be almost as thick as the 50-pair cable.

FIG. 2.
Showing the sun beginning to penetrate the fog.

FIG. 3.
Showing the sun's effect on the frosted wires.

that this would not relieve them of liability for the old telephone they see that there is no loophole, and sign the inevitable form at the tariff rate. They readily pay for the shifting of their office desk and other furniture to the new premises; surely the telephone is not of less value to them.

The usefulness of the telephone in business is indicated at once by the position in which it is placed. If a table instrument, it is sure to vie in seniority of position with the pen or ink. If a wall instrument, we find that no part of the wall is too valuable to give up for its use. In the house many are the central positions in which it is found. A week or two ago a lady asked that the telephone in her house be shifted a few feet, from a position which one would usually look upon as a very flattering one indeed for the instrument. The removal was from the top of the piano—the pinnacle of melody—to an adjoining table. "O, what a fall was there, my countrymen!" Not so, as the change took place just because the cord was too short, and now the association of the telephone with the music of the piano is about as close as ever. But to change the tune, and as a final word, might I be allowed to indicate some of the stiles or impediments which militate against the securing of orders. In bygone days an officer could never afford to go about aimlessly, much less can he follow an aimless course now. Certainly Dryden's words do not apply in these days:

> "He trudged along unknowing what he sought,
> And whistled as he went for want of thought."

The Glasgow area is circumscribed in a way not experienced in earlier days. A man in the Post Office area must take a Post Office telephone, or do without, and it somehow goes against the grain to turn so many over to them. It is a comparatively rare thing now for an officer to go out in the morning with a letter received in the office, containing a sure order or "dead snip" as it is usually called here. The old inquiry: "Any dead snips this morning" is seldom heard. Still, in spite of the oft-heard remark that things are stiff, I don't think anyone can say that the old buoyant canvassing spirit has disappeared. It would be a pity if they could affirm, that that hope which springs eternal in the human breast had departed for aye. One likes to feel that the cheerful vigour of Browning's lines is still in evidence. He speaks of

> "One who never turned his back, but marched breast forward,
> Never doubted clouds would break,
> Never dreamed though right were worsted, wrong would triumph,
> Held, we fall to rise, are baffled to fight better,
> Sleep to wake."

SYDNEY TELEPHONES.

FOR some time changes have been in progress, says the *Sydney News*, in connection with the telephone exchange, which when completed should do much to facilitate the working of the service. For instance, as the new common battery switchboard is being completed it is displacing, section by section, the present magneto switchboard. These sections, as they are removed, are to be re-erected in another room.

At present this room is occupied by the large clerical staff of the telephone manager's branch. This staff is to be transferred to another room, some distance a way. The re-erection of the sections will practically transform the present clerical room into another exchange, where as many as 30 attendants at one time will be engaged. The room is said by the attendants to have a low roof and a bad light, and to lack sufficient ventilation for its new purpose; but Mr. Nelson says that alterations are to be made which will render it suitable for working conditions.

On the present magneto switchboard each operator attends to the calls of 100 subscribers. In Melbourne each attendant attends to 66 subscribers only. After much delay the Commonwealth authorities have at last admitted that the load now carried by the Sydney Exchange attendants is much in excess of what it should be, and are providing for a change that should have been made long ago. The provision of the additional switchboard will reduce the number of subscribers per operator to 75 or 80, so far as the magneto board is concerned. On the new common battery board each operator will look after 140 subscribers, but the working of the board is much simpler and more speedy. The new room will be fitted up within a couple of months.

The department is taking other steps to facilitate the working of the telephone system, by grouping the bureau telephones on special boards (at present numbers of them are connected with the same boards as subscribers' telephones), and by increasing the number of lines giving direct cross-suburban connection between the various outlying exchanges.

SCREWDRIVERS.*

By H. A. SLACK.

BEING asked to contribute a ten-minutes' paper, I had considerable difficulty in choosing a subject which should be at the same time useful, and capable of being treated in so short a time. I hope I have succeeded in finding a useful subject, but ten minutes do not allow much time for introductory remarks, and as I consider the subject so important, I do not apologise for the remarks to be made, notwithstanding the apparent simplicity of the subject

On looking through a well-known encyclopædia for a few hints, all I could find was this: "*The screwdriver is used for turning screws.*"

This is the kind of information you get by trusting to books.

I was watching a cobbler putting rubber heels on a pair of boots the other day. As he hammered the screws in, I ventured to ask: "What are the slots for in the screw heads?" Looking surprised at my ignorance, he replied, "Why, they are to get the screws out with!"

We must bear in mind at the telephone works that the slots are used for both putting the screws *in* and taking them *out*, and as the sides of the slot suffer so much in the operation, I think there must be something wrong with either the man or the tool.

I hope I am sufficiently well informed to be able to say that, generally speaking, it is the tool which is faulty. Look at Fig. 1, for instance. You can find lots like this if you have a look round the shop—*perhaps on your own bench*—yet the users wonder why they have so many rejections for burred screws. (Of course, I am not suggesting that the testroom screwdrivers are like it.)

The only thing this is fit for is to dig dirt out of cracks with or to prise work to pieces. I'll defy anybody to remove a tight screw with an instrument of destruction like this. You might as well try to wind your watch up with a poker.

The business end of a screwdriver ought to be a perfect fit in the slot of the screw, and this is where the difficulty comes in. There are so many different screws to be treated in our work that one is tempted to use the same screwdriver on screws which call for a much larger or smaller instrument, as the case may be.

Another point which seems to be quite overlooked is, that a countersunk screw requires a different-shaped blade to the one used for a round or standard head. Fig. 2 will explain itself. It is obvious (when pointed out) that a square-ended screwdriver used in a chamfered screw does a great deal of damage to the material in which the head is sunk, unless it is too small to be safely used. Therefore the corners should be taken off at the same angle as the sides of the screw head. It is surprising what a number of men you meet who have never given it a thought, but keep on using a square ended blade for flat headed screws.

Still another point is this.

The tool should be as long as can conveniently be used, not as many people suppose, to get a greater leverage—which is a fallacy—but to prevent the blade slipping out of the slot when the hand wobbles about, as it always does to some extent. An inch movement of the hand from the normal position when driving a screw, rocks the point of the screwdriver with a long blade much less than with a short one, consequently the blade is much less likely to burr the screw and scratch the workman's "trade mark" (*sic*) across the face of the instrument.

It is this fact which gives people the impression that they can get more power with a longer screwdriver. They can certainly transmit more power, but it is because the screwdriver does not slip.

Every man ought to have half a dozen screwdrivers or more. It will pay to have plenty, because the more you have, the less work each one will have to do, besides having the right one for the right job, which is bound to save rejections.

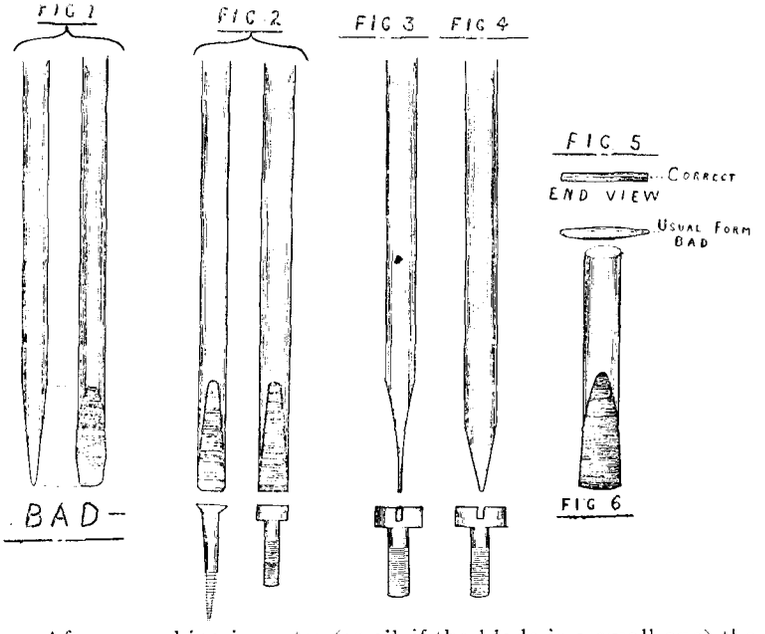
The best steel to use for the blades is "round cast steel" such as Stubbs'. Don't use silver steel; it costs twice as much, and is no better—if as good. The most useful size depends on the work in hand, but three-sixteenths-inch and quarter-inch are generally most useful, though some smaller sizes should also be obtained.

When making the blades, always *hammer* the end flat first. This adds greatly to the strength of the point. Never file one out of the solid, however small it may be, and take care that the steel is not overheated or you will break the tool the first time you put a strain on it. When you have knocked a few out leave them in the cokes to cool slowly.

Now have at hand a screw which is the most usual size to be driven by your screwdriver, and file the steel to fit it exactly, both as regards width and thickness. This latter is most important. Many are the screwdrivers that are broken through being too thin at the point. I have seen some which would make good wood chisels. The flat sides of the blade should be parallel where they enter the screw, as in Fig. 3, *not* as in Fig. 4. Any bevel or roundness will cause the tool to slip out of the slot. The end of a screwdriver point is shown on Fig. 5, and the excellence of the tool depends on the sharp squareness as there shown. Many screwdrivers are almost oval when you look at the point end on.

Now for a few remarks on hardening.

No matter how perfectly you may have filed up the blade, its useful life can be greatly shortened by faulty hardening. In fact, most of the failures are due to mistakes made in this operation. Many people seem to imagine that the main idea is to get the steel as hot as possible, when as a matter of fact the duller the redness at which the steel will harden the stronger will be the resulting tool.



After quenching in water (or oil if the blade is a small one) the blade should be cleaned with emery, and held in the flame about an inch from the point until the brightened part turns almost blue, then again quench.

The other end of the blade should be hammered to somewhat the same shape as the business end, and knocked into a handle, preferably of boxwood. An oval shape is to be obtained if possible, as it gives a better grip, and is less likely to roll off the bench, to be picked up by somebody who does not want to make one. A round handle is better, however, for small tools, because you can revolve it more quickly.

It is sometimes required to take a number of screws out in the shortest possible time. This can be done by putting a screwdriver blade in the lathe and crossing the belt. But the blade must be rounded as shown in Fig. 6, or the lathe would have to be stopped for each screw. This method is safer than using an automatic screwdriver, being less likely to dig holes in the woodwork.

A screwdriver of medium size should be kept with the end of the blade cut at an angle. This will be found extremely useful when a screw is to be operated from a position somewhat to the side of the vertical—that is, when you cannot get straight over the screw owing to some obstruction. Let me give a parting word of advice to those who make a few good screwdrivers. Keep your eye on them, and refuse to lend them, or you will soon want some more steel.

I think I have now said enough to encourage a little improvement in the most *abused* tool in the workshop.

* Paper read before Nottingham Factory Telephone Society.

THE NATIONAL TELEPHONE COMPANY'S SALES BUSINESS.

BY W. V. PEGDEN, *Metropolitan Sales Manager.*

IT is with a certain amount of trepidation mixed with boldness that I offer these remarks respecting the sales business of the National Telephone Company to the JOURNAL—with trepidation because there may be a genius lurking in some dark corner ready to mete out sledge hammer blows upon the head of the luckless individual who ventures to deal with the subject—with boldness by reason of the fact that (as far as I know) nobody has up to the present contributed an article to these columns offering ideas, suggestions or criticism thereon. This would lead one to think that the subject is either so unimportant that it is not worth touching upon, or of so abstruse a character, that those capable of saying something are holding back until a lead is given. If the latter is the case, Mr. Editor, I hope a goodly number will come forward and enter into a friendly discussion, which I am sure would be interesting and instructive.

Speaking from the Metropolitan standpoint, there is no doubt the National Telephone Company holds the premier position as contractors for telephone sales installations, but considering the facilities afforded the staff for meeting the public when dealing with exchange matters, is the position the Company holds as good as it should be? Is everyone, whatever his or her position, doing his utmost to further the interests of the Company in pushing the sales business whenever an opportunity presents itself. I am inclined to the belief that apathy reigns over a good proportion of the staff in regard to this class of business. What is the reason? In my opinion, there are two good reasons, either of which should be an inducement for anyone to assist in increasing sales revenue; firstly, the knowledge that more business means more work, which of necessity means preventing reduction of staff; that, to my mind, at the present juncture, in view of the transfer of the staff to the State, is all-important, and probable increase of staff, which obviously spells better chance of promotion. Secondly, the encouragement given by the Company in the shape of commission, which gives everyone a chance of increasing his or her income. I can imagine some saying: How can I begin? How can I increase the sales business and my own income? My answer is: Easily; there is a big field for private installations in offices, warehouses, shops or private residences. The opinion is growing stronger and stronger that to communicate by telephone is to save labour, time and money, and to keep one's eyes open to see where these three important factors in private or commercial life can be saved, and suggest the remedy, *i.e.*, telephones, is how to begin to increase sales revenue and increase your own income. Having made the suggestion and secured the attention of the probable purchaser, all you have to do is to ring up the sales office, who will send a representative in hot haste to give expert advice, prepare an estimate, submit a quotation, and do all that is possible to secure the order; the order being secured, the amount of bonus is forwarded promptly.

Considering the ramifications of the Company's gigantic organisation, it is surprising with what smoothness the different departments are brought together to assist in the compiling of an estimate. Each department is more or less a specialist in the work it does, and one can readily understand it is no easy matter to get together engineers, construction, maintenance, stores and workshops' men and joiners, all of which in a job of any magnitude have to be consulted, and add their quota of advice and estimate, and I am glad to say the needful *esprit de corps* is there, and the prevailing spirit is co-operation in the interests of all concerned.

We are invited to tender for all kinds of installations; one enquiry was for an automatic exchange of about 100 stations. This reminds me of the correspondence in the JOURNAL some time back, and it may interest readers to know that for some years past an automatic exchange of about 50 stations has been working at Guy's Hospital. The latest addition to intercommunication installations is the dictograph system (the designation is misleading, as no one would associate it with the telephone), the great feature of which is that the user talks at any reasonable distance from the instrument, within the limits of an ordinary room. The voice of the party replying is thrown out into the room by means of a small loud-speaking horn contained within the instrument. An earpiece is provided for use when the conversation is confidential, the act of taking the earpiece off the hook cutting out the loud-speaking horn.

Enthusiasm in sales—I am referring to revenue received through introductions by staff outside the sales staff—has increased steadily during the past four years.

Contract officers, fitters and inspectors comprise the bulk of the participants; these no doubt have greater facilities than indoor staff. Now and then we get an introduction from the clerical staff, and once only from an operator, this enquiry (I am sorry to say) did not materialise, although every nerve was strained to secure the order, for we did so want to get a lady on our list. Notwithstanding the foregoing, it will surprise the readers of this article, that, of the whole of the Metropolitan staff, only ·0063 per cent. were responsible for introducing sales business during the month of November, 1909.

We have had many curious and interesting experiences. An order was received from a poor old Gaelic shepherd with a remittance for 7*s.* 6*d.* for a metaphone, as he was "hard o' hearin'." Another order was for ten miles of No. 1 galvanised iron wire from a Protectorate, and our minds were exercised as to what use they were going to make of it. We were told it was for telephone circuits; as the copper wire was annexed by the natives for making bracelets and other ornaments, unfortunately the Protectorate quoted the wrong gauge, and another indent was received for No. 11 gauge. The 5½ tons of the No. 1 gauge is on its way back, and by the time it reaches the London Docks it will have travelled something like 17,000 miles.

Another order, the execution of which we claim to have been rather smart, was for 30 poles for Lisbon. Within 24 hours of its receipt, arrangements were made with the Thames Steam Tug Company to send a tug and barge to collect at the Grays depôt and the poles were shipped on a vessel at the London Docks. We have to thank the elements for this order, and can say with truth "It is an ill cyclone that blows nobody good."

Since commencing this contribution, the December number of the JOURNAL has been distributed, and in it I find a reference to the Sales Department of the Company by Mr. A. D. Pike. His remarks in the fourth paragraph of his paper I fully endorse. It is a fact that the Company's reputation stands head and shoulders above the majority of other contractors; both the quality of its apparatus and the high standard of labour it employs are unique in the telephone world. Our tenders have been rejected in favour of other contractors who have under-quoted, to the sorrow of the purchaser, who has paid dearly for his experience, and in the end the Company has profited thereby, both financially and in reputation. Clients are alive to the fact that a cheap telephone installation is not the best, and, as in the case of every other commodity, if a good article is wanted, its full market value must be paid.

BRIGHTON STAFF BENEVOLENT SOCIETY.

THE annual meeting of this society was held at Brighton on Jan. 13 when Mr. C. F. Moorhouse (District Manager) was re-elected president, and he, together with Messrs. F. Roberts, and L. Parsons, were re-elected trustees.

The vice-presidents and auditors were re-elected *en bloc*, and Messrs. Lamper, Dyer, Frampton and Tyler were elected to the committee in place of others who have retired. Mr. W. Young was re-elected secretary.

The statement of accounts for 1909 shows a total expenditure of £35 5*s.* 3*d.*, the receipts being £45 1*s.* 2*d.*, leaving a balance in hand at Dec. 31 of £23 18*s.* 2*d.* The expenditure includes the maintenance of one member in a convalescent home for a fortnight.

During the year donations have been given to hospitals amounting to £10 19*s.*, and grants and loans to necessitous members of the fund have been made to the extent of £20 14*s.* 9*d.*

During the year 63 letters of admission to the various hospitals have been issued to members.

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"BY THE STAFF FOR THE STAFF."

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TELEPHONE MONOPOLIES.

IN an article in the American journal *Telephony*, entitled "Is the Telephone a Natural Monopoly," the writer quarrels with the assumption that it is, saying that he has never met with anyone sufficiently courageous to supplement the statement with any convincing argument. He goes on to attribute the huge development of the telephone during the last fourteen years, as compared with the moderate development of the first twenty years, to the blessings of competition! But it is surely not difficult to understand that the process of realising that the telephone was a necessity and not a mere supplementary convenience should take the general public at least twenty years, and that, having realised it, the development of the system would be sudden and phenomenal without the additional stimulus of competition. After twenty years of monopoly, says the writer in *Telephony*, the telephone was a sickly plant. To-day after fourteen years of healthy competition it is a sturdy tree; 20 plus 14 equals 34, which, subtracted from 1909, takes us back to the year before the telephone was patented, and that year and the years during which it was in experimental stages are of course credited to the monopoly stage. The absurdity, however, of attributing the growth of the telephone during the last fourteen years to competition is plainly demonstrated by a glance at the progress of those very dissimilar places, New York, Berlin and London. In New York, where there is no competition, the number of stations has been increased in the last twelve years from 32,800 to 326,900; in Berlin (no competition) it has increased in the same period from 42,400 to 112,500; and in London, where the amicable competition between the Post Office and the Company may be left out of account, the stations have increased in the last fourteen years from some 13,000 to 181,000.

The reason why we consider the telephone a natural monopoly is in theory simple and incontrovertible. Effective competition, as understood by pro-competition telephone men, consists of hostile, rate-cutting competition between two administrations which, naturally enough, allow no intercommunication between their respective systems. The obvious result is that, unless and until the one system drives the other out, every business man of any consequence must subscribe to each system in order to speak with those subscribers who are connected with a different system to himself. If the rate-cutting results in the reduction of the annual subscription from, say, £10 to £6, he has the pleasure of either paying £12 or of speaking to a limited number of the subscribers in his town. If one system succeeds in ruining the other the subscriber may enjoy the benefit of the reduced rate with full power of speaking to all subscribers, but it is more probable that the winning company, having carried on the conflict at some loss will seize the opportunity of revising their rates and putting them on a more paying basis. The waste of capital will, in any case, have been an economic mistake, involving duplicate routes of poles, duplicate trenches in the streets, duplicates of all kinds, with all the public inconvenience they entail.

To those who point to the benefits of railway competition we would observe that the cases are not analogous. The economic waste noes not exist. A competitive line from London to Manchester serves not only Manchester but carries traffic to Leicester and Derby from both these cities; similarly, in the alternative route, traffic to and from Rugby and the Potteries is accommodated, in addition, in each case, to the hundreds of towns and villages served by wayside stations.

The writer in *Telephony* in proof of his argument that competition does not tend to duplication of service, cites the case of eighteen cities in Illinois, Iowa, Indiana, Michigan and Ohio where only 8 per cent. of 77,598 stations are duplicates. We are not in a position to traverse this statement as regards these cities, but we are able to say that in 1905 out of 61,900 stations in Philadelphia 10,000 were duplicates; of 21,100 in Baltimore 4,800; of 29,500 in Cleveland 3,500; of 38,400 in Pittsburg 5,200; of 32,800 in St. Louis 4,800; of 12,900 in Rochester 2,156, and we could instance numerous others where the percentage of duplicates is very considerably above 8. As regards Europe, we know that in Glasgow the Corporation, at a cost of £380,000, succeeded in adding some 11,000 names to the list of telephone subscribers, of which 5,200 were also on the National Telephone Company's system, while the Brighton Corporation, at a cost of nearly £53,000, provided 1,404 people with telephones, half of which were duplicates. Turning to Stockholm, where two systems are in competition, the latest figure that we possess shows the number of duplicates was nearly 13 per cent., that is to say, that more than one-half of the smaller competitor's subscribers were on both systems, as is usually the case.

Indianapolis, Portland, Kansas and other places with over 130 telephones per 1,000 inhabitants (Los Angeles, in fact, has 215 per 1,000) are quoted as evidence of the good results of competition; but Spokane (153), Dallas (150) and Denver (141) afford equally good evidence of development achieved without competition. Seeing, therefore, that the best telephoned cities in the world have attained their development without competition, and having regard to the economic waste and the onus thrown upon subscribers of having to subscribe to two systems, we think the case against the "natural monopoly" of the telephone is not proven.

VOLUME FOUR.

THE present number brings the fourth year of the JOURNAL to a close. Originally started as a private publication with a circle of readers confined to the staff of the National Telephone Company, its scope was rapidly extended and it is now a recognised telephonic organ not only in England but on the Continent and in America. Its subscribers are found not only in the capitals of the world and the large cities in our colonies, but also in such British outposts as Regina (Saskatchewan), Amherst (Nova Scotia), Krugersdorp, Kimberley, Port Elizabeth and Mossel Bay (South Africa), Mauritius, Honduras, Barbados and Penang. In Japan it is read in Osaka, Kyoto and Hokaiddo; in Europe it reaches Voss in Norway, and Groningen in Holland. Its articles are quoted in the foreign technical press and its contents given in bibliographies of telephonic and telegraphic publications. At the same time it has been the policy of the Editing Committee not to lose sight of the special appeal which the JOURNAL primarily makes to the Company's staff, and it is believed that it will be acknowledged that no diminution in the interest or extent of this section has taken place. Whilst the JOURNAL has continued to record the social and educational gatherings of the staff, and their movements, promotions and marriages, it has always devoted special attention to keeping them abreast of telephonic developments and has endeavoured to secure useful and instructive information on all subjects. Nor has the lighter and humorous side which is present in all human concerns been neglected. Although, we trust, never derogating from the ways of dignity we could not be accused by our worst enemies of being ponderous. For the continued success of the JOURNAL we have to thank our numerous contributors and collaborators, alike those whose efforts reached publication and those whose excellent papers are crowded out from lack of space or from duplication of the subject treated. Our writers are drawn from all quarters of the United Kingdom and during the past year the principal centres supplying the larger contributions were: Head Office, fifteen articles, besides all editorial matter; London, twenty-three; Glasgow, six; Liverpool and Nottingham factory, four; Leeds, Bristol, Leicester and Sheffield, three each; while Brighton, Portsmouth, Crewe, Cheltenham, Gloucester, Bournemouth, Bath, Dublin, Birmingham, Nottingham, Yarmouth, Cambridge, Exeter, Blackpool, Manchester and Swansea each furnished one or more of the principal articles. This of course does not exhaust the long list of towns supplying notes and items of interest which assist greatly in the completeness of our work. With an increasing circle of readers and a wide field of contributors we look forward without misgiving to the commencement of our fifth volume.

NOTICE.

PORTRAITS on sunk art plates of Mr. Agnew, Mr. Stirling and Lord Harris are now obtainable, price 6*d*. each. Those of Mr. Waite, Mr. Hidden and Mr. Cowley will shortly be ready.

Binding cases for Volume IV, at 1s. 6*d*. each, are also obtainable on order.

1909.

ANOTHER year, another tome complete,
While we have scarcely marked Time's hurrying feet!
Events crowd on, their import hardly known,
Yet we stand never still. The Telephone
Five hundred thousand stations has attained,
And in the year some fourteen thousand gained,
And, if not quite *annus mirabilis*,
Many past years were not so good as this.

C. B. exchanges rise on every hand,
Supplanting older types throughout the land.
"Standardisation," while it rules the day,
In No. 1 Equipment has full play.
And to variety gives little scope,
So that in our exchanges (after POPE)
"Grove nods to grove; each alley has a brother,
And every switchboard just reflects the other."

Wisdom from Law with pains we did acquire
And now we know what is a private wire;
Learnt, when outside the street door of a friend
You press the bell-push, you unwitting send
A telegram along a telegraph!
(This is good law—not numouristic chaff!)

Much ink was spilt and much good breath expended
Deciding whether contests should be ended
'Twixt team and team. 'Twas subsequently found
The stimulus was helpful, but not sound.

The automatic evergreen appears
And fills our buoyant Press with hopes and fears,
"A Girl-less Telephone" their headlines show,
"Doomed Operators," "Hello-Girls must go."
Whether the fear was greater, or the hope
We know not, but (again recalling POPE)
Of operators it may be assumed
"They never *are* but always *to be* doomed."

The Turk at last the telephone will reach.
Who sitting in his harem can have speech
Outside; and grow as fond, we dare to say
Of his transmitter as his narghileh.

Lastly, Elections vexed the public mind.
Success *both* parties in the upshot find,
The Company but faint excitement show,
They have reformed their Tariffs long ago!

W. H. GUNSTON.

HIC ET UBIQUE.

IN last month's *Pall Mall Magazine* Mr. Barry Pain, dealing with "The Poetry of Common Things," has the following verses on "The Intermittent Buzz":—

You want 95803 Pad,
  You say so in your clearest tone,
You want it much, you want it bad,
  You want it on the telephone.
What dashes from your lips the cup?
  What almost makes you swear—or does—
And hang the vain receiver up?
  It is the intermittent buzz.

Some girl in some remote exchange—
  As cheap and cold as frozen lamb—
Knows what fierce thoughts within you range,
  Knows them and does not care a bit.
She hears, impartial, those that call;
  One gets his 95803,
And you that buzz-like sign of all
  That the subscriber cannot be.

Yet think how like that maid is fate,
  Unjust, relentless, in its sway;
That gives to one, the rich and great,
  But takes the poor man's hoard away;
That puts some idle chance between
  Two hearts for one another fain;
Think of the tragic might-have-been,
  Then ring the bounders up again.

We only wish to remark that our exchanges so far from being as "cold as frozen lamb" are efficiently warmed by radiators or other up-to-date heating apparatus.

A DISTRICT manager pressing a subscriber to pay his outstanding telephone rental, received a note to the effect that the dilatory one would be pleased to *meat* him. As the subscriber was a sausage manufacturer the invitation sounded to the district manager ominous. Humour has made us familiar with foreign bodies in sausage skins, but hardly with anything so tough as a telephone man.

THOSE of our craft who expect to find beneath the earth rest from all their troubles may be disappointed. At least, attached to a tombstone in a Harlesdon undertaker's shop is a card which reads: "You may telephone from here."

THE late William Allan, M.P., was addicted to impromptu verse-making upon occasions. In 1889, when the telephone was still somewhat of a novelty, he wrote the following:

1889.

Dear Sir,—
I frankly own
Your telephone
Has satisfied us all.
Whene'er we ring
The wondrous thing
Instanter comes the call.

For business ends,
Or chats with friends,
Its value none can gauge.
In truth, I wot
Who use it not
Are far behind the age.—W. A.

OUR OFFICE BOYS.

BY H. NETHERWAY, *London*.

IF an office boy happens to be one of the characters in a book, the author almost invariably describes him as a lanky, unkempt individual, whose fingers are always in a more or less inky condition, and who neglects his duties to read of the fascinating exploits of some bloodthirsty "hero" whose lines are cast in the Golden West.

Now if this type of office boy does exist, and can so far neglect his duties to follow out his natural inclinations by bespattering himself with ink and delving into romances during office hours, all I can say is that his duties are considerably less than those of the boys employed in the Correspondence Department in Salisbury House. Their time is fully occupied, and if they wish to discuss their favourite author or the merits and demerits of the latest sensation in fiction, I really think that it is done after office hours.

To many it will, I believe, be of interest to know how the boys in the Correspondence Department are employed, and many will be somewhat surprised to know what a variety of work they have to make themselves conversant with. Hence this short article.

To describe their duties as comprehensively as possible, it will, perhaps, be best for me to sketch an imaginary lad's career in the correspondence office, as before he leaves that department for another he will go through all the various duties connected with it.

The first we hear of him is in the form of a letter of application for employment in which he regrets exceedingly that he is trespassing on the Company's valuable time, states his age, mentions that he has passed the ex-seventh standard, and concludes by expressing his certainty of being able to give satisfaction if engaged. It is quite an orthodox letter, and one which would be expected from an ex-seventh standard boy. The simple straightness of the lines and the regular spacing between them gives one a suspicion that the notepaper was faintly ruled in pencil before the epistle was written; if it was, a vigorous application of rubber has removed the traces. That he is an ex-seventh standard boy does not weigh in his favour one iota; they all are, and it is a lamentable fact to record that the majority are woefully unworthy to have ever attained to that dignified position.

This lad's letter, however, being well and neatly written, and, moreover, there being a vacancy, he is asked to call. On the appointed day and punctual to the hour he arrives. A diminutive figure, looking rather scared and confused by the continual clacking of typewriters, he waits to be interviewed, holding an obviously new "bowler" in both hands.

A short examination is passed, and he is informed that the Company will accept his services in the capacity of office boy at a salary of 10*s*. per week.

His first duty is to collect from the typists all completed letters, and to distribute them to the various offices in Salisbury House. An experienced lad goes round with him for the first day, which period is usually long enough thoroughly to teach a new boy this small duty. The collection and distribution of these letters is made every hour up to four o'clock, and from that hour until five as often as possible. There is, of course, a good deal of spare time between the deliveries, and that is spent in learning exchange codes, sealing and stamping of envelopes containing circular letters, etc. In connection with the sealing of envelopes, one lad, I remember, would insist in bringing about the adhesion of the flap in the most primitive of ways, scorning the more up-to-date method of using a damp brush. He was told that he would do himself an injury and for a while he would try and worry along sealing them in the orthodox manner, but sooner or later the relapse came. He was a most healthy-looking boy and seemed to suffer from none of those pangs of thirst which one would have imagined to have been the inevitable when engaged on such an uncongenial occupation.

After having dealt with the delivery of typists' letters for a week or two, his duties are changed, and he collects correspondence from outgoing baskets in all departments. I do not know whether it is that a boy after having been through his initial stages in the Company is apt to become over confident, and consequently somewhat careless, or whether it is the existence of such a number of baskets to collect from which makes him constantly forget to clear one or two of them. The fact however remains that he does forget, and in consequence thereof a telephone message is received from one or another department: "Your boy has not cleared my basket." By the time he has been on this duty for, say, a fortnight, he has learnt the codes of the exchanges, and knows the districts into which the Metropolitan area is divided. Armed with this knowledge it is safe for him to begin learning to sort not only the correspondence which is collected from the before-mentioned outgoing baskets, but also that which is sent in by Head Office, local offices and other sources.

This is a duty which takes a considerable time to learn. Queries are always arising and little mistakes always happening. As everybody knows, the reference numbers are not always quoted on memoranda, and those on which they have been omitted are almost always the most ambiguous. The result is that memoranda are forwarded to the wrong departments, and delay occasioned, through the omission of the reference numbers rather than the error of the boy when sorting. Again, quite a large quantity of the addresses on service envelopes are so execrably written that the opinion even of experts would be divided. Is it any wonder, therefore, that the office boy, with his short experience, blunders? Not only are some of the addresses badly written, but are, in addition, addressed to officials who exist in the mind of the sender alone. For example, I saw one the other day directed to District Manager, Soho, London Wall. The lad who was sorting, on coming to this envelope, popped it into the pigeon-hole allotted for Gerrard, evidently arguing that Soho was in Gerrard district, and that he was right in sending it there. He was wrong, however; it was a stores matter.

The duties which I have so lightly dealt with up to now all relate to inside work, and a boy is usually kept at that until he is fairly conversant with it before sending him to deliver correspondence to the near Divisional Engineers' offices, exchanges and Head Office.

Comes the time, however, when he has to take his turn delivering correspondence to the near exchanges and Head Office first thing in the morning. You picture him shouldering his bag at 7.15 a.m. (it was until quite recently 6.30 a.m.) on a cold, wet morning, ready to start on a dreary round to Holborn, Gerrard, Paddington, Head Office, etc., and to collect correspondence from

THE above picture from an attractive almanac issued by a Birmingham electrical engineer, Mr. Walter S. Vaughton, is interesting as showing how the telephone has become a common object of life, and also exhibits it not unfavourably in artistic composition.

each of those places which may be for Salisbury House. He rides where he can, but the 'bus is not much in evidence at that hour in the morning, and he realises as well as anybody that "Underground to anywhere," so blatantly in evidence at Tube stations, is a delusion and a snare. The task, however, has its compensations; he leaves earlier than his fellows, and during the summer months early morning duty is much sought after. As is, perhaps, generally known there are several journeys made to Head Office during the day, and once to the exchanges in addition to the early morning round. These, however, are looked upon as mere "outings," and they make a break in the ordinary office work which is relished by whichever boys are chosen to go.

There is one other duty which I would mention, that of assisting in the despatching of correspondence by post after 5 p.m. There are the letters to subscribers to be sealed, stamped and posted. Envelopes to be addressed for the despatching by post of such inter-departmental correspondence to the local offices and exchanges which are too far out to be delivered by hand, and the preparation of the correspondence for the early morning messengers referred to previously. As the post clerks, as they are called, cannot finish before 6.30 p.m. at the earliest, their hour for arriving is fixed at 10 a.m.; truly a welcome change from early morning duty, although I believe the majority of lads in the Correspondence Department prefer the early duty to the late.

With the duties I have mentioned there is, in connection with each a certain amount of spare time. This spare time can, however, be filled up with the innumerable small duties attached to the Correspondence Department, such as the filing of works orders, addressing Post Office fee accounts for the forthcoming month with the addressograph machine, placing in alphabetical order the carbons of letters written to subscribers, and other items too small to mention, but each of which take time. Also, when a boy is unexpectedly absent from one of the local offices, the Correspondence Department is called upon to keep things going there *pro tem.*

There is one interesting fact I think it as well to mention, and that is the Company, as far as possible, draw their junior staff from *among the office boys. A lad who displays ability and an interest* in his work does not remain at the bottom of the ladder long, but he is promoted when a vacancy for a junior occurs in one or another of the departments. This system of promotion has been the means of placing several one-time office boys in responsible positions throughout the Company's offices.

I have but briefly gone into the duties which the office boys are engaged in; to go into them fully would occupy too much space, but those which I have mentioned will, I think, go to show that their work is something more than that which is usually supposed to be the task of an office boy, and will, moreover, show that a lot depends upon the accuracy and promptness in dealing with the small duties allotted to them. The mistakes they make are legion, but is it not natural that if "to err is human" the preponderance of errors should be on the side of the inexperienced? When experience has been gained, it is quite probable that many of the boys will be able to prove by the manner in which they carry out their work that there is the making of "Telephone Men" in them, and who shall venture to say that not one of them will ever adorn the front page of the JOURNAL in some future year?

SWANSEA OPERATORS' TELEPHONE SOCIETY.

EXTRACTS FROM SOME PAPERS READ AT THE DECEMBER MEETING.

"ENTHUSIASM AN ESSENTIAL TO AN OPERATOR." *By Margaret Sweeney.*

MANY subjects have been written on and discussed at our various meetings, but one which I think will bear consideration is that of "Enthusiasm." You will no doubt agree with me that enthusiasm is, or ought to be, an essential point in telephone operating, and without it a good telephone service can hardly be expected.

An enthusiastic operator will always deal with her subscribers in a courteous and pleasant manner, giving the impression that her aim is to please, and inspiring confidence in all with whom she comes in contact. Ambition coupled with enthusiasm in the work which she has to carry out will bring its own reward, for an operator with such qualities is bound to get on. The lack of those qualities will render her indifferent in every way.

Enthusiasm creates good will toward those with whom and for whom we work, and as an example of its value let us apply it to call office working. Courteous treatment of those who are constantly using a call office may very likely result in their becoming telephone subscribers, whereas discourteous treatment would give the opposite result. It is on those people particularly that good or bad impressions are easily made, with important results. Lack of enthusiasm is bound to mean lack of interest in one's daily work, and without interest one can achieve nothing. An iron or steel merchant's interests lie in dealing with iron or steel, and as his interest wanes so will his business. Just so with an operator. Her interests are the Company's and her subscribers', and if her interest wanes, both the Company's and her subscribers' business suffers.

A little more enthusiasm among our subscribers would do much towards making and maintaining a good telephone service, and this, I think should be impressed on the minds of our subscribers.

They should be induced to work with the operator and help her as much as they can, and not make themselves a drag upon her as some subscribers do, always complaining of trivial things without the least consideration.

The operator, again, should show her enthusiasm by being observant. She may observe that a certain subscriber's line is frequently engaged. By taking this up in the proper way, the subscriber may be induced to take additional lines. Or she may

notice that a certain party who has not a telephone is constantly being asked for. This, by being properly taken up, may result in that individual being induced to become a subscriber.

These all constitute enthusiasm, and are essential points in good operating.

"TEAM WORK AND THE CAPTAIN OF A TEAM FROM A JUNIOR'S POINT OF VIEW." *By Queenie Le Dong.*

THE very term "team work" implies an arrangement of strength, augmented effort, and an entire combination of the varied stages of competency. The captain in her post of superiority can utilise each operator in her team to the utmost advantage; she becomes conversant with each one's peculiarities, and can easily discern when her girls are doing their utmost. She, so far as her own team is concerned, assumes the position of supervisor, and if she so wills can bring her team up to such a state of efficiency that the burden borne by the supervisor or clerk-in-charge is rendered considerably lighter. If the team occupies a busy position, where the indicators are constantly falling, the help-one-another principle smoothes the way considerably, and the service, by such a means, will show a vast improvement. If I were a captain (as is perhaps natural) I should strive to make my team the best in the exchange. First of all, I suppose I should try to become expert as an operator, and cultivate a retentive memory, so that the proper methods and expressions were always used. How should I do it? I fancy I hear someone say. "Well, by just doing your best and encouraging your team to co-operate with you and do their best." I should try to bear in mind continually that I once had been a junior myself, and I should try to treat my girls as I then liked to be treated.

I would always like to be patient with each one, and let them feel that I realised their difficulties in so far as my own experience allowed me to, and that though I was responsible for their working, yet to each I passed on their share and had confidence in their keeping that trust inviolate. Think not my expressions presumptuous, they are just my opinions, for I feel confident that very largely, if not entirely, the captain is responsible for making either success or failure of team work.

"PRIVATE BRANCH EXCHANGE WORKING." *By Lily Rees.*

A PRIVATE branch exchange operator occupies very much the same position as a subscriber with regard to the service generally, and views matters from a very different standpoint to a main exchange operator. As far as her own branch exchange goes, she must be her own supervisor, having no one to fall back upon. She must rise to occasions, and act with tact and discretion. We at the subscriber's end observe many things, one of which is the difference in tone of operators. The same expression used by different operators sounds very different, in the one case being pleasing and smooth, in another case irritating and rough.

It would be an education for all main exchange operators to spend a certain time at a private branch exchange. They would then see themselves as subscribers see them. An efficiently worked private branch exchange is an advertisement both of itself and of the service generally, but in order that it shall be efficient co-operation between the private branch and the main exchange is needed.

The private branch exchange operator knowing the operating methods and working of a main exchange understands the difficulties which at times occur. She is thus frequently able to smooth over little troubles, which a subscriber, not knowing what was going on at the other end of his line, would, in his ignorance, make worse, ending probably in his abusing the service generally.

TELEPHONE SERVICE AND THE GENERAL ELECTION.

IT is gratifying to record the contents of a letter received from a gentleman who successfully contested a seat in the South-West Lancashire district during the last General Election. The letter, which was voluntarily contributed, runs as follows:—

"I should like to express my thanks to the telephone operators and employees for the consistent courteousness and attention that we have received on all occasions."

The telephone was only installed a short period prior to the election, and when it is borne in mind the exceptionally busy time experienced, the letter reflects all the more credit upon the staff concerned.

A STUDENT'S JOYS.

("N" Course. Paper 4, Question 9: A person buys apples at five for 2*d.*, and sells half of them at two a 1*d.* and the remainder at three a 1*d.*, and clears 1*d.* profit. How many apples did he buy?)

I AM studying mathematics,
Studying with all my might,
Yet I'm feeling most elated
(All unhappiness *post* dated),
Joy which can't be under-rated;
I have got my apples right.

Plus and minus may confound me,
Mensuration floors me quite;
Though I funk my first exam.,
Feel my progress all a sham,
Yet I do not care a jot:
I have got my apples right.

Arithmetical progression
Fogs my mind as with a blight,
Simultaneous equations
Ever mock me with evasions;
Solace on these sad occasions
Is: I've got my apples right.

Colleagues who with optimism
Struggle to let in the light,
At my denseness may say "Blimey,"
And endeavour to decry me,
One success they can't deny me:
I have got my apples right.

Paris may become a quagmire,
City of most dreadful night;
Fire and storm and such defections,
Floods, and General Elections,
Ne'er will trouble my reflections:
I have got my apples right.

When the final Clarion calls me
I shall answer with delight,
Though of failings they remind me,
And a back seat Peter find me,
Eve will have to sit behind me;
I have got *my* apples right.

A. E. A. (London).

THE METROPOLITAN STAFF HOSPITAL COLLECTIONS.

THE second annual meeting of the above took place at 58/9 London Wall on the evening of Jan. 26, Mr. C. B. Clay, the Metropolitan Superintendent, presiding.

A somewhat small but appreciative audience listened to an excellent speech by the secretary of the Hospital Saturday Fund (Mr. A. W. Davis), covering the work of the fund during the past year, for which he was afterwards accorded a hearty vote of thanks.

Mr. J. Leslie and Miss F. J. Minter were unanimously re-elected as hon. treasurer and hon. secretary respectively. On the motion of Mr. T. Caparn it was decided that in future those members of the Company's staff who were elected to serve as delegates to the Hospital Saturday Fund should act as the committee for the management of the staff collections instead of having two separate bodies as hitherto, and 30 ladies and gentlemen were subsequently elected.

The hon. secretary read the annual report for 1909, from which it appeared that the total subscriptions amounted to £715 19*s.* 1*d.*, and although it would appear from the gross amount paid in for the previous year that they had reduced their subscriptions by £15 13*s.*, it should be pointed out that £59 11*s.* 9*d.* credited to them during the early part of 1908, represented late amounts paid in direct to the Hospital Saturday Fund for 1907, and they had therefore actually increased their subscriptions this year by the substantial sum of £41 18*s.* 9*d.*, which again made the staff the second largest subscribers to the fund.

Reference to last year's figures showed that this increase was spread over seven out of the eleven departments, and greatest credit was due to the different collectors.

The actual figures were as follows:—

Head Office		£65	4 11
Metropolitan Office		65	13 4
Traffic Department		335	7 4
Electrophone, Limited		1	4 1
Contract Department		12	4 0
Sales ,,		0	18 10
Engineers ,,		105	6 2
Maintenance, Electricians' Department		66	5 5
Construction, ,, ,,		21	5 0
Stores Department		25	17 8
Workshops		9	1 11
Special Collections.			
Bank whist drive	£5 5 0		
Westminster whist drive	1 12 5		
North-Eastern district smoking concert	0 13 0		
		7	10 5
Grand total		715	19 1

Special attention was drawn to the increase in social entertainments on behalf of the fund, and best thanks were due to the instigators of the events which attained such good results, viz., Miss A. Reekie and Messrs. E. Chambers and A. Mitchell respectively.

If the subscriptions to the Hospital Saturday Fund had been greater, the demands had correspondingly increased, and the total letters and other benefits issued by the fund during the year is 706, which was an increase of 94 on the previous year.

These consist of the following:—

Dental letters to private dentists	222
,, ,, ,, dental hospitals	25
Surgical appliances, including spectacles	56
Eye hospitals	62
Chest hospitals	56
Ear, nose and throat hospitals	79
General hospitals	63
Skin ,,	22
Children's ,,	22
Women's ,,	24
Hospitals for diseases of the heart	7
,, ,, fistula	2
,, ,, epilepsy and nervous diseases	8
Dispensaries	12
Convalescent homes	20
Ambulances to hospitals	2
Loan of ambulance boxes	10
Letters to the Surgical Aid Society	10
Specialists' advice at reduced fees	3
Royal Mineral Water Hospital, Bath (special)	1

and were distributed among the following departments:—

Head Office	68
Metropolitan Office	60
Traffic Department	231
Contract Department	11
Engineers' ,,	151
Maintenance, Electricians' Department	90
Construction, ,, ,,	19
Stores Department	36
Workshops	11
Necessitous cases outside the staff	25

The 247 letters issued to dentists represented at least £61 15s., each letter being worth 5s., but, unfortunately for the patients and the fund, this amount did not go far in dentistry, and for any additions required the fund had paid in each case not less than one-fifth of the cost. All medical men agreed as to the effect decayed teeth had on the general health, and the telephone staff would appear to be fully alive to this.

The convalescent home letters were twenty as against 22 last year, and one letter was issued for a special course of treatment to the Royal Mineral Water Hospital at Bath.

Out of ten ambulance boxes issued one has been returned, but the total boxes now on loan for the staff in different exchanges and offices remained, with the one issued last year, at the same figure.

A remarkable increase of 25 was shown in the number of letters issued to necessitous cases outside the staff. Several other applications were received, but on enquiry could not be recommended to the fund.

The ambulance lectures had been followed up, and the Misses D. Hatfield and E. Godden succeeded in passing the third examination, entitling them to the medallion of the St. John's Ambulance Association.

Out of the 31 delegates elected last year the following ladies and gentlemen are serving on the different committees of the fund:—

Finance Committee—Mr. J. Stirling and Mr. P. J. Mantle.
Distribution Committee.—Mr. H. G. Corner and Mr. T. Caparn.
Collection Committee.—Mr. A. Macfarlane, Mr. E. Ruppersberg and Miss E. Richards.
Surgical Appliance Committee.—Miss A. Reekie.
Ambulance Committee.—Mr. C. Appleford.

The call upon the time of members of the committees for the many meetings during the year was very considerable, but from the record the attendance of the members from our own staff had been exceedingly good, and the Hospital Saturday Fund had been the first to recognise the help and assistance given at all meetings of the board or committees.

In addition to this some of their delegates were representing the fund as governors of hospitals.

In conclusion he thanked first the delegates for the support they had given him during his second year of office as hon. secretary; secondly, the collectors for their untiring efforts and work they had done in making their collections so successful; thirdly, the Company for continuing to bear the expenses in connection with those collections, which must amount throughout the year to no inconsiderable sum; and lastly, but not least, the Hospital Saturday Fund and its courteous secretary for the unfailing kindness and generosity with which they have met demands.

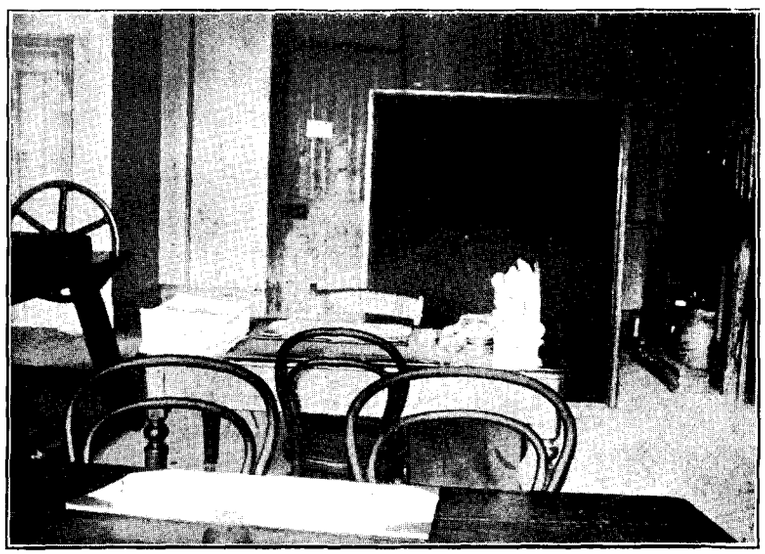
The meeting closed with very hearty vote of thanks to Miss Minter for her work as hon. secretary and to Mr. Clay for his kindness in presiding at the meeting.

A REMINISCENCE OF THE PAST.

By FRED BARR.

THE picture given below shows the old wire-testing room at Oxford Court, where the writer was employed in the early days of telephony, some twenty years ago. In this room was tested all wire used by the Company.

The department was under the control of Mr. C. L. Addenbrooke.



In the corner to the right stood a mirror galvanometer (one of the earliest, and made by Mr. Addenbrooke for the Company). Behind the large green baize board in the centre of the room stood the bridge and scale. The line wire was stretched along the floor for the conductivity test. The breaking strain of line and stay wire was taken on the machine shown to the left of the picture. The torsion machine does not appear in the picture.

From the picture it will be seen there is a distinct comparison between the testing arrangements as it existed twenty years ago and as it exists now.

CORRESPONDENCE.

THE PUBLIC CALL OFFICE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

CALL office development is an interesting subject, and I perused Mr. Stewart's article in the December JOURNAL and also Mr. Murray's criticism in the January issue with interest. The article and letter in question desire to impress upon your readers that Glasgow and Hull respectively are the best public telephoned cities in the kingdom. Is this so? Municipal competition had to be faced in both places, and in this connection it must have been policy to open as many call offices as possible to prevent the opposition from securing a footing. If a prospect could not be induced to become a subscriber at the ordinary tariff rates, try him for a call office? This appears to be so in Hull, as the ratio of call offices to ordinary subscribers is 1 to 7·5 (a very high percentage).

Norwich has a population of 115,000; the number of call offices established 50 (including kiosks). Each one of these stations is in a first-class position, carefully selected, and as far as the business centre of the city is concerned, a sign is always in view. Direction signs have been fitted to either trolley poles or electric light standards, and here the success of a call office mainly depends. A call office well placed with three directing signs at different points is worth

three call offices indifferently situated with simply a sign outside the premises. I am aware that it is not always possible to secure these additional signs, but we have been fortunate enough to do so in Norwich. Each of these 50 public stations is a good revenue earner, and in every case there is a considerable increase in the takings from year to year. Call offices are not retained whose revenue fails below a certain amount. Commercial men and other visitors to the city frequently comment that Norwich appears to be well equipped with public telephones. I have not included message rate and measured rate subscribers (hotels, etc.) exhibiting signs, and I refer to Norwich city only.

What constitutes a well public telephoned city, viewed both from the Company's standpoint and that of the public?—Numerous call offices established indiscriminately on the population basis, and therefore in a great many cases unnecessary and unprofitable, or a smaller number established after carefully studying local requirements, supported by the public and proving a profitable investment to the Company.

Norwich, Feb. 10. HENRY F. ALLEN.

Re CAPITAL AND REVENUE.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

I SHALL be glad if any reader of the JOURNAL who is interested in the above, or in political economy, can reconcile the following statements for me:—

David Ricardo in 1821 *disagreed* with economists of that period who stated that "labourers and labour" is capital.

Adam Smith in 1835 stated that "labourers and labour" *is* capital.

McCulloch in 1853 *agreed* that "labourers and labour" is capital.

McDonnell in 1871 said it was *not*.

John Stuart Mill in 1877 (who was a disciple of Ricardo) also *disagreed*.

Professor Minton in 1888 stated that "*wages are* capital exchanged directly with the labourers for their labour."

Here we have three eminent authorities who say "*Yes*," and also three equally as qualified who say "*No*."

A peculiar point in the matter is, that the Company in their working of the capital and revenue account agree with all the six of them, as the following remarks will show:

All labour (wages) spent on new construction work is allocated to "capital account," and all labour (wages) spent on maintenance is allocated to "revenue account," *i.e.*, the Company agree with Smith, McCulloch, and Minton that labour is capital, and with Ricardo, Mill and McDonnell that it is *not*.

The point I wish to raise is this: Is wages (labour) capital or is it not? As someone must be right, and someone must be wrong, who can decide? Apologising for troubling you in the matter.

Keighley, Jan. 31. E. PARKINSON.

THE TELEPHONE STATIONS OF THE WORLD.

TO THE EDITOR OF THE NATIONAL TELEPHONE JOURNAL.

IN your honoured magazine for August, 1909 (Vol. IV, No. 41, page 97), is given a series of statistical data of the growth of the telephone. Of these figures we must remark that as far as concerns Denmark you have calculated with subscribers, but for Sweden with stations; still the figure for Sweden is given a little lower than it appears from the last communications. In accordance with fact the figures will be as follow:—

	Number of telephone stations.			Number of inhabitants per telephone station.	
	Jan. 1, 1908.	Jan. 1, 1909.	Jan. 1, 1910.	Jan. 1, 1909.	Jan. 1, 1910.
Sweden ..	151,104	166,927	abt. 171,000	33·5	abt 31·4
Denmark ..	70,097	78,233	abt. 80,000	33·1	abt. 30·1

Jan. 29. KJØBENHAVNS TELEFON-AKTIESELSKAB,
Den administrerende Direktor.

[One or two letters are unavoidably left over.]

LONDON NOTES.

TWO members of the staff have been the recipients of wedding gifts from their colleagues recently—Mr. F. C. Herbert, Fault Clerk, Kensington, was presented with a dinner and tea service; Mr. C. N. French, Contract Officer, Sydenham, with a clock. Another presentation was a travelling bag to Inspector E. F. Soper, Ealing, on resigning from the service.

CONGRATULATORY letters on smart work accomplished by the Company's staff continue to come in. A recent one was from a large city firm, acknowledging the ability shown by Contract Officer W. D. Flannery in negotiating an important contract with them. Another was from a subscriber in Bromley, expressing thanks for and praise of the excellent service given during the General Election.

THE outstanding feature at the annual meeting of staff contributors to the Hospital Saturday Fund was the admirable address given by Mr. A. W. Davis, general secretary to the fund. The vast scope of the fund's good work was made very evident by his clear and lucid statement of its various agencies and activities. Mr. Clay evinced his never-failing interest by presiding, and Miss Minter, the staff secretary, presented a very complete report of the work done during the year.

THE "Avenue" tea to poor children has now become a recognised event. This year it assumed larger proportions, as an appeal to sympathisers outside the Avenue Exchange staff resulted in more money being available. The tea was held in the Stepney Temple on Saturday, Jan. 29. Seldom has an afternoon been so much enjoyed or spent so well. If not hard work it was certainly steady and sticky work handing out buns of all descriptions for rapid consumption by an array of 500 happy and hungry boys and girls. The children were drawn from the poor homes in the neighbourhood, yet cleanliness was a prominent feature with all. The presence in some cases of boots obviously a few sizes large, the absence in one or two others of socks, were pathetic evidences of the home struggle against poverty. Too much praise cannot be given to the operating staff at Avenue for their unstinted labours in organising and carrying out the whole of the arrangements; especially must be mentioned Miss Forge, the Clerk-in-Charge, and Miss Flinn, the secretary to the committee. The table decorations, which were most effective, were largely composed of artificial flowers made by the operators; these flowers were eagerly accepted by the youngsters afterwards to take home. A marionette and cinematograph entertainment followed the tea; then as the children filed out of the hall, where for a few hours some sunshine had entered their sombre lives, they were each handed a surprise package of an orange, a bag of sweets and a new penny. One sometimes doubts whether any real good is done by gatherings of this kind; the best way to dissipate such doubts is to see the unfettered whole-hearted enjoyment of the children.

MR. F. G. BROWN'S elementary lecture on "Engineering" was well attended, but it is rather regrettable that the staffs of departments other than the engineers' were not better represented. The least interesting portion of the lecture was that dealing with the Service Instructions; one is scarcely prepared to attribute that entirely to the lecturer, however. Mr. Brown treated his subject in a very able manner, but unfortunately there was not sufficient time allowed for questions and discussion. No doubt this will be remedied when the second portion of the subject is dealt with.

THE Benevolent Society have induced Mr Clay to become president for this year. He makes no secret of the ambition that his year of office may be distinguished by the enrolment of all members of the staff not now contributing to the fund. One or two of the departments have considerable leeway to make up, and unfortunately it is amongst those sections of the staff to which the largest grants have to be allotted that the record for a low percentage belongs. A penny per month is not a heavy burden on anyone; the good which these accumulated pence may do when the day of trouble comes along is incalculable. We hear that the committee is considering a plan of campaign; whatever course is decided upon, we appeal for the co-operation of all the present members towards its success.

THE discussion on Mr. H. G. Bishop's paper at the Telephone Society on Feb. 7 was very lifeless. This may have been largely due to the historical character of the paper; it is always difficult to debate a statement of absolute facts which cannot be gainsaid. In the abstract, the subject, "The Launching of a No. 1 Central Battery Equipment in a New Building Specially Designed for a Telephone Exchange," seemed full of interest. Mr. Bishop has shown us before that he has the gift of originality, and it was therefore a trifle disappointing that he confined himself so rigidly to a narrative of the procedure adopted when new buildings and equipment are being planned and constructed. He is, however, to be congratulated on the able manner in which it was done.

THE Chancellor of the Exchequer's acknowledgment of "conscience money" is a fairly common feature of the daily papers. The following communication received at the Chief Accountant's office shows that telephone users, as well as income-tax payers, may suffer from uneasy qualms:—

"I enclose postal order for 2s. for use of telephone.—Yours, X."

If Mr. X. should see these lines, they will doubtless relieve him by the knowledge that his departure from the path of rectitude has been absolved.

Whist drives have been conspicuous by their absence for some weeks. The "Bank" traffic staff entered the breach on Feb. 9, and provided a most enjoyable evening at "Ye Mecca," Ludgate Hill. There were over 200 present, and the financial result will be a handsome donation to the Staff Benevolent Fund. The "Bank" staff are indefatigable in their efforts to make these gatherings successful; doubtless their next whist evening on April 27 will be no exception to the rule.

AT the last meeting of the Telephone Society's Traffic Branch, two papers were read, one by Mr. Weldon, Assistant Exchange Manager, Hop, on "Some Elementary Notes on Telephone Apparatus"; the other by Miss Tringham, Supervisor, Operating School, on her recent visit to Manchester. Mr. Weldon's subject is one which ought to meet a need in the education of our operators. He unfortunately had made his paper somewhat long, with the result that there was no time for adequate discussion. Miss Tringham's paper on her visit to Manchester showed powers of observation and vivacity, but naturally the subject-matter gave few points for criticism. An interesting comparison was made between the "Number, please," as uttered in the long-drawn-out syllables of Lancastrian speech and as launched at the subscribers in the hasty if more liquid notes of the south.

THE Metropolitan staff dinner is, as the chairman said, becoming more and more the "London" dinner. Certainly the handsome proportion of Head Office representatives present at Frascati's on Feb. 18 justified the remark. Long may such a happy state of things continue, the Post Office and 1911 permitting. Practically all the head officers of the Company supported Mr. Clay at the chairman's table. The dinner was excellent, the music delightful, the good fellowship abundant, and the two speeches capital. Altogether everybody is to be congratulated on a successful and happy evening. The chairman had some interesting comments to make on the changes of the year and the rapid increase of the Company's business in London. He also made a strong appeal for more support to the Staff Benevolent Fund. Mr Clay is very popular with the staff, so that Mr. Edmonds, the vice-chairman, had an easy task in proposing his health. The toast was, however, received all the more heartily because of the excellent and witty speech made by its proposer. Mr. Edmonds' chaffing of Mr. Clay over the description given of his powers and methods by an imaginative writer in a London paper recently was particularly

enjoyable; the picture of the old telephone boys' dinner of the future no less so. It is to be hoped that next year the committee will be able to arrange for ladies to be present, and so fulfil one of the "aspirations" announced by the vice-chairman. One wonders also whether the method of grouping the tables under departments might not be modified in some way.

GLASGOW NOTES.

A WHIST club has been formed in connection with the office staff and under its auspices a whist drive was held on Friday, Feb. 11, when the prize winners were Miss Marshall, Fees Department, and Mr. D. B. Hebenton, Rental Registers Department.

THE Hillhead staff held their annual dance in the Prince of Wales' Halls, Sauchiehall Street, on Tuesday, Jan. 25, 1910. Music was supplied by Carl H. Miller's orchestra. The evening was most enjoyable. Messrs. D. Graham and P. Cunningham acted as M.C.'s.

THE staff of the Douglas Exchange held a whist drive and dance in the Prince of Wales' Halls, Sauchiehall Street, on the evening of Feb. 14. There were about 140 present. Music was provided throughout the evening by Con. Williams' Band.

THE Operators' Society and Club held its fourth meeting of the session in the Masonic Halls, West Regent Street, on the evening of Jan. 24, 1910; this took the form of a social evening. There was a large attendance of members and friends, and a number of guests. Tea having been partaken of, Mr. C. J. Millar opened the meeting with a few remarks, and thereafter a programme of songs, readings and dancing was much enjoyed.

THE ordinary meeting of the National Telephone Society (Glasgow and West of Scotland districts) was held on Feb. 10, 1910, at 8 p.m. in the Technical College, when Mr. Gilbert presided over a good attendance. Mr. Thomas Pettigrew lectured on "Iron." The lecturer described the various properties of the mineral and the uses to which it was applied; explained and demonstrated the theory of magnetic fields; and compared the B. H. curves for cast iron, steel, wrought iron and stalloy. Finally he devoted some time to the consideration of methods of voice production, and made a sanguine forecast of the results which might yet be attained by means of molecular magnetism. Frequent recourse to the blackboard and a series of ingenious experiments—most of them conceived by the lecturer—made the evening more than usually interesting and informative. The customary visit to the refectory terminated the meeting.

AFTER the severe snowstorm at the end of January, which seems to have been general, the Company's faultsmen and wiremen would no doubt feel entitled to adopt as their motto "Aye, ready." Fortunately no serious damage was done in Glasgow, but after office hours on the evening of Friday, Jan. 28, word arrived that six gangs were urgently required in Dublin. The aid of the telephone and telegraph was at once requisitioned, and soon the men thus specially called upon began to report at the stores. Accompanied by two engineers they left the city the same evening by the eleven o'clock train, and it is hoped they will be of considerable assistance in the Irish capital.

TRON and Gorbals Exchanges jointly held their third annual dance in the Trades Hall on Jan. 29, about 120 being present. A most enjoyable evening was spent.

ON Jan. 26 the Post Office Govan Exchange was transferred to the Company's Govan Exchange, and the former exchange was closed. This completes the second link in the "amalgamation" chain, which may, in masonic parlance, be said to have been "Well and truly welded."

AN "at home" was held in the Masonic Halls, West Regent Street, by the Argyle Exchange staff and friends on Jan. 15; there were about 150 present, and an enjoyable evening was spent in music and dancing.

A VERY successful "smoker" and presentation was held in the Bank Restaurant, Queen Street, on Friday, Jan. 28, Mr. G. M. Hale presiding. Mr. L. S. Summers, the guest of the evening, who is leaving the Company's service to take up the duty of General Organiser for the Amalgamated Society of Telephone Employees, was presented with a handsome pocket-book and sum of money, along with an umbrella, suitably inscribed, for Mrs. Summers. Mr. Shankland, in making the presentation, paid tribute to the untiring energy and organising abilities displayed by Mr. Summers on behalf of his fellow-employees, and expressed regret at losing his services, but wished him every success in his new venture.

LOCAL TELEPHONE SOCIETIES.

Birmingham.—The fifth meeting was held in the operators' dining room, Central Exchange, Birmingham, on Feb. 1, when Mr. Dipple (Chief Exchange Inspector) read a paper entitled "The Power Plant." The lecturer dealt with the theory of motors and starting switches, method of starting up, and maintenance of machines. The switches and protective apparatus for the changing and discharge circuits were described, and a number of slides showing various power switchboards, circuit breakers, reverse current relays, were used to illustrate the lecture. A description of the cells and best methods of maintenance followed.

Birmingham Operators.—The fifth meeting of the session was held on Feb. 10, at the Mecca Café, Miss G. Borg being in the chair. Competitive papers were read by Miss I. Adams, Miss M. Bower, and Miss D. Millward, on "The Advantages of an Operator," "An Operator's Reflections" and "Much Ado About Nothing," respectively. The papers were all excellent ones, and showed that a great deal of thought had been given to them, and in consequence the committee decided to give three prizes. The judges were Messrs. Cornfoot, Dipple and Terras, who awarded the prizes as follows:—Miss D. Millward, first; Miss M. Bower, second; Miss I. Adams, third. The meeting was followed by a whist drive, which concluded a very enjoyable evening. Mr. Terras and Mr. Williamson kindly gave prizes for the whist, which were won by Miss Goodenough and Miss Biddle.

Bristol.—The fifth sessional meeting was held on Feb. 10, when papers were given by Mr. F. G. Eager, Test Clerk, on "Central Battery Instrument Designs," and Mr. A. W. Ashbee, Sub-Engineer, Bristol, on "Notes on Central Battery Testing." Mr. Eager pointed out the urgent need of standardisation for the various apparatus, so that parts may be interchanged without delay. Mr. Ashbee emphasised the necessity for careful testing, and pointed out one or two simple yet effective methods of finding intricate faults. The papers were well received and created much discussion. Mr. Perkins, District Manager, occupied the chair. There was an attendance of 40, representing 65 per cent.

Bristol Operators.—The fifth sessional meeting was held on Feb. 10, when three papers were given by members of the Bristol operating staff as follows:—Miss M. G. Weston, "The Impatient Operator"; Miss W. Simmons, "The Use and Importance of the Telephone"; and Miss W. H. Hook, "First Impressions of an Operator." The papers were excellently written and read and were very well received by all members of the staff present, creating a good deal of discussion and complimentary remarks. The operators are now all looking forward to their final meeting on March 3, similar to that held in March last year, which will consist of competitive papers. Mr. Perkins, District Manager, presided over an attendance of 53, representing 80 per cent.

Cardiff. The fifth meeting was held at St. John's Schoolrooms on Jan. 20. The attendance was good considering that the General Election was prevailing at the time. A paper was read by Mr. S. F. Whetton entitled "Central Battery Working." In the course of his lecture, which was illustrated with limelight diagrams, Mr. Whetton briefly outlined his subject, and more especially dealt with testing apparatus, also describing the working and use of the exchange manager's, engineer's, supervisor's and monitor's desks. A discussion followed.

Cardiff Operators.—The fifth meeting of the session was held on Feb. 8, the District Manager, Mr. B. Waite, being in the chair. A most interesting paper on "Supervising" was given by Miss E. Van Riel, Clerk-in-Charge of Newport Exchange. Miss Van Riel brought out many good points, one of the most important being that the object of the supervisor is not to act as a spy upon the operators but to assist them in every way possible, with a view to giving an efficient service. She also pointed out the essential qualities of a supervisor, and remarked upon her many and varied duties which are somewhat difficult to define. A discussion followed in which several of the members took part.

Cheltenham.—The seventh meeting was held on Feb. 15, 100 per cent. of the members being present. A very interesting paper on "Line Provision and Economy in Distribution" was given by Mr. C. Elliott, dealing with overhead (open and cable), overhead-underground and underground distribution and the loading o circuits. An animated discussion followed.

Cork.—The paper on "Transmission," which was announced to be read by Mr. Kidd, District Manager, at the meeting held on Jan. 20, had to be unavoidably postponed, but a very interesting and excellent series of lantern slides, kindly supplied by the Engineer-in-Chief and the heads of some of the provincial centres as well as by the Cunard Steamship Company, were shown and were much appreciated by the large number present.

At an adjourned meeting held on Feb. 19, Mr. Kidd read his paper on "Transmission" before a fairly large attendance, having regard to the inclemency of the weather. The subject was treated in a very comprehensive manner, and the various points and matters in connection with "Transmission" from an engineering point of view were fully explained by the lecturer and illustrated by some very interesting diagrams. A discussion on the paper brought the meeting to a close.

Cornwall.—The sixth meeting was held at Truro on Feb. 9, Mr. G. Hooper, president, being in the chair. Two papers were read, one entitled "Details of Line Work," by Mr. W. F. Wilson, and one entitled "The Operation of the Telephone Service," by Mr. F. A. Sowerby; 100 per cent. of the members were present.

Dundee.—Mr. W. Brown presided over a large attendance at the January meeting. Mr. F. Crichton and Mr. P. G. Martin read papers on "Stores and Stores Bookkeeping" and "Loads on 'A' Positions and Junction Working." The discussion on Mr. Martin's paper was postponed till next meeting.

At the February meeting, Mr. W. Brown presiding, the discussion on Mr. P. G. Martin's paper on "Loads on 'A' Positions and Junction Working" was taken up. Mr. Jas. Livie read an interesting paper on "Wayleaves," dealing with the humorous as well as the practical side of the question.

Exeter.—The fifth meeting was held on Feb. 7, Mr. H. Reid in the chair. Three short papers were read: "Correspondence," by Miss C. Hatten; "Supervision of Sub-Exchanges," by Miss E. Heaps; "Post Office Fees," by Miss G. Soper. Unfortunately Miss Heaps could not be present, her duties taking her to another part of the district, and her paper was read by Miss Small. It was a well attended and most instructive meeting.

Gloucester.—The fourth meeting of the session was held on Jan. 25 at the "Y" room, Clarence Street. It having become necessary for the meetings to be held in an outside room. Mr. C. Elliott, District Manager, took the chair. The Provincial Superintendent, Mr. R. A. Dalzell, read his paper on "The Study of Detail and Costs." This was listened to with very great appreciation by a very large number of the members of the Gloucester and Cheltenham societies, the meeting having been arranged as a joint one, and resulted in profitable discussion.

The fifth meeting of the session was held at the "Y" room on Feb. 17. The chair was taken by the District Manager, Mr. C. Elliott. Two very excellent and instructive papers were read, their subjects being: "Rentals and the

Company's Bookkeeping," by Mr. W. G. Jack; "Storekeeping in General," by Mr. H. G. Pocock. Animated and profitable discussion followed, in which the following members participated:—Messrs. J. L. de Medewe, F. W. Sceats, A. Berry, G. A. Greenland and S. G. Hare.

Isle of Man.—The eighth meeting was held on Jan. 21, the District Manager presiding. A paper was read by Mr. T. Clucas, Lineman-Inspector, on "Instrument Visiting." The lecturer explained the methods of examining the various parts of instruments, etc., by means of blackboard illustrations.

The ninth meeting was held on Feb. 4, the District Manager presiding. A paper was read by Mr. E. H. Vick, Lineman-Inspector, on "Testing and Jointing Underground Cables." The lecturer was introduced by the District Manager, who explained he wished the staff to learn all possible about this important subject. The various methods of testing were explained by blackboard diagrams, and a small length of cable was jointed as an illustration. Considerable discussion followed the reading of both papers.

Leicester.—The society held a successful meeting on Feb. 11 at the Foresters' Institute, when Mr. H. Marshall (Chief Clerk) read an account of the "Local Development in the Last Decade." The remarkable growth of the business was outlined in a most interesting manner, the lecturer skilfully avoiding complicated statistics. Mr. Ernest Rendell read a paper on "Routine Testing," in which the details of the test were amplified and the great importance of routine testing emphasised. The president occupied the chair.

Leeds.—At the meeting held Feb. 2, two papers were read. One by Mr. P. Gavins (Observation Officer) on "Traffic, with especial reference to Operators' Irregularities." The other by Mr. W. D. Scutt (Chief Inspector) on "Line and Instrument Maintenance." The attendance was good, the papers instructive, and the discussion animated.

Liverpool and Birkenhead.—The fourth meeting was held on Jan. 20, Mr. E. S. Francis, president, in the chair. Mr. A. Ward read a paper on "Crosby No. 10 Central Battery Equipment." He gave a very clearly detailed account of the equipment at Crosby together with full particulars as to the working of the circuits, to illustrate which some very good slides were shown. A lengthy discussion ensued.

The fifth meeting took place on Feb. 10, Mr. E. S. Francis, president, in the chair. Mr. Napier, Head Office, read a paper on "Traffic." The author dealt in a very interesting manner with a great number of important features. Particular attention was directed to the care and accuracy required when records are being taken, and in the preparation of information for use in connection with exchange design. A very good discussion terminated the proceedings.

Liverpool and Birkenhead Operators.—The third meeting was held in Kirkland's Café on Feb. 1, when 150 members were present. Two very interesting papers were given by exchange managers, each entitled "My Exchange." Mr. R. A. David, Exchange Manager of the "Royal," touched upon various matters in connection with the working of his exchange and especially on "Supervision"; he gave some valuable hints on this important subject which were well received. Mr. J. Parry, Exchange Manager for the Liverpool sub-exchanges, then read his paper, which gave short but interesting descriptions of one or two of the least known exchanges; hints on co-operation between exchanges and various points in connection with ringing junction working; the duties of a chief operator, etc. The discussion which followed was animated, and the questions asked were chiefly in connection with ringing junction working. After the discussion Mr. Hidden made a presentation to Miss Foxworthy, Clerk-in-Charge, Birkenhead Exchange. This was a gold pendant, subscribed for by the girls of the Birkenhead sub-exchanges. Miss Foxworthy, prior to her appointment as Clerk-in-Charge, had been Superintendent of the Birkenhead sub-exchanges. One or two musical items closed an already successful evening.

London (Traffic Branch.—The fifth meeting of the session was held on Feb. 16, in Hall 201, Salisbury House. Miss F. J. Minter in the chair, and there was an attendance of 150 members. Miss E. M. Tringham, Supervisor Operating School, read a paper on "A Visit to Manchester," which also proved of interest to all members present. The paper was illustrated by lantern slides of Manchester Royal and City Exchanges, some of which were kindly lent by Mr. T. A. Prout. Mr. Staite, Traffic Manager, Liverpool, was present. Mr. H. G. Weldon, Assistant Exchange Manager, Hop, gave a paper entitled "Some Elementary Notes on Apparatus for Operators," and it was evident that Mr. Weldon had taken considerable trouble in preparing the paper, which was also illustrated by lantern slides and experiments.

Luton.—Mr. Spencer Maber, Local Manager, Ware, read a paper entitled "Stores and Storekeeping" to a moderately attended meeting of this society on Feb. 14.

Manchester.—On Jan. 14, Mr. E. A. Laidlaw, of the Engineer-in-Chief's Department, gave a very interesting and instructive paper on "Central Battery Private Branch Exchanges," which was illustrated by diagrams and a number of excellent lantern slides. In the subsequent discussion numerous points were raised which were effectively dealt with by the lecturer. It is very satisfactory to note that there was an attendance of 100.

On Jan. 28 a very interesting and instructive lecture was delivered by Mr. A. E. Moore, A.M.I.E.E., of the School of Technology, Manchester, on the "Measurement of Small Circuits." The difficulties met with and precautions to be taken in the measurement of small and very small continuous, alternating and oscillating currents were admirably dealt with, and a full description given of the construction and working of permanent magnet moving coil, dynamometer and therminal types (including the Duddell ammeter and voltmeter), the oscillograph and "string" galvanometer.

The C. D. (Manchester) club held their monthly meeting on Dec. 20. Mr. T. A. Jeffrey was in the chair and the speaker was Mr. Hayward, Chief Fitter, who selected for his talk matters referring to "Extensions and Removals." Mr. Hayward's remarks were followed with great interest, the discussion afterwards bringing many points to light that were quite new.

The C. D. club held another meeting on Feb. 7, under the chairmanship of Mr. A. Ramsey. The proceedings started with a substantial tea, followed by a talk from Mr. Magnall, the Manchester Engineer, on "Notes for Contract Men," showing where at times they may be a considerable help to the Engineering Department, saving time and labour by giving full information as to the situation and rooms into which the leads are to be taken. His talk was very instructive and was followed by an interesting discussion. An excellent concert terminated the proceedings and thanks are due to Mr. Caine for presiding at the piano. Amongst the visitors was Mr. O. G. Lee, Contract Manager from Liverpool, who expressed his pleasure in being amongst the Manchester men, and contributed to the discussion from a Liverpool point of view.

Newcastle.—The fourth meeting was held at the Mining Lecture Hall on Jan. 12 with Mr. J. Gwyther (president) in the chair. A paper was given by Mr. Laidlaw (Engineer-in-Chief's Department) on "Exchange Equipment," and was illustrated with a number of lantern slides. At the close of the paper a number of slides were shown giving method of operating a variety of calls. Those taking part in the discussion were: J. Gwyther, G. Marshall, A. Livingstone, R. W. Jackson, F. W. Gaskins. The paper was most instructive and interesting, and was greatly appreciated by the members.

The fifth meeting was held at the Roma Café, Grainger Street West, on Feb. 1, when Mr. E. T. Payne (vice-president) was in the chair. Three papers were given, the first was Mr. J. P. Urwin on "Contract Work"; the second by Mr. A. MacDonald on "Rentals," commencing from the first advice of connection; and the third on "The Magneto System" by F. Atherton, which was illustrated with a large diagram showing the various connections. The discussions after each paper was taken part in by Messrs. O. Preston, B. Brewis, E. T. Payne, A. McEwan, J. Hastings and J. P. Urwin.

Nottingham.—The fifth meeting was held on Feb. 4 at the Huntingdon Street Schools. Three papers were read by Misses Cartledge, Green and Tuke, and being subject to competition a prize was given for the best paper read. This was won by Miss Green. A large number of visitors were present at this meeting.

Nottingham Factory.—The fifth meeting took place on Feb. 7, 100 being present, when Mr. F. W. Francis, of the Head Office Engineers' Department, read a very instructive paper, illustrated by lantern slides, on "Good Design and Workmanship in Relation to Telephone Service." The necessity of good apparatus, the characteristics of good service, the essential points to be observed in the design of instruments and switchboard apparatus, and the importance of good workmanship were dealt with in a very interesting manner. A well sustained discussion followed.

North-East London.—The fourth meeting was held on Jan. 27 at 17 and 19, West India Dock Road, the president, Mr. F. Morley Ward, in the chair. The Metropolitan Electrician (Mr. G. F. Greenham) read a paper entitled "Modern Maintenance Methods," in which he described the work and organisation of the Maintenance Department, also the various records that were got out and the reasons for them.

Oldham.—A paper was read on Jan. 27 at the Café Monico, Oldham, by Mr. A. Spargo, of Stockport, upon the subject "Aids to Traffic." Mr. Spargo pointed out how, with the co-operative interest of the entire staff engaged in the erection of subscribers' lines, fitting of instruments and other work, traffic might be encouraged. An interesting discussion followed. Mr. W. B. Cheetham presided.

Portsmouth.—On Feb. 1 Mr. J. H. Yates read a paper on the "Construction of Aerial Lines Past and Present." One great point emphasised by him was the utility of the copper sleeve in the place of the old method of soldering joints. He pointed out that many jobs which had, in the former method, to be of the nature of temporary work could be finished completely on the job by the new method without waiting for the troublesome soldering iron or fire pot. The chair was taken by Mr. S. J. Smith, the District Manager, and the discussion which followed after was taken part in by the chairman and Messrs. H. Legge and M. Humby.

On Feb. 10 a paper was read by Mr. Newman, of the Engineer-in-Chief's staff, on "Boiled-out Joints." Some very good slides were shown illustrating the method of making joints at the different stages, and an interesting discussion took place afterwards, which was taken part in by Messrs. Legge, Pharo, Yates, Lees, Bennett, Saunders and Shannahan. The lecturer dealt with the subject in a very able manner, and answered the many questions put to him in a convincing way. The chair was taken by Mr. S. J. Smith, District Manager.

Sheffield.—The fifth meeting was held on Feb. 18, when Mr. E. A. Laidlaw, of the Engineer-in-Chief's Department, read his paper on "Exchange Equipment." Mr. F. Barr was in the chair. The lecturer, as was to be expected, dealt conclusively with the up-to-date common battery exchange equipment and described in detail the proper lay-out for these exchanges, and the importance of correct development studies and calling rates being obtained. The paper was illustrated by a large number of lantern slides, in addition to a working model of a common battery system. Considerable discussion took place at the conclusion of the paper.

Southern (London).—A meeting of this society was held on Jan. 24, when an engineering paper was read by Mr. P. G. Hay, entitled "Off the Beaten Track—A Case of Trolley Induction." The paper included an interesting account of a breakdown in the Croydon area, and was well illustrated by lantern slides.

Stirling.—The fifth meeting was held on Feb. 1. Mr. A. Buchanan of the district office read a paper on "Stores," and there was a good turn out of the members. A very interesting discussion took place at the close of the paper.

The sixth meeting of the session was held on Feb. 15, when four short papers were given by Misses Baird, Chappell, Cunningham and Drummond. The first three dealt with operating questions and the last with tickets, with special relation to the points requiring attention on behalf of the operating staff. The papers were greatly appreciated.

Swansea.—The fifth sessional meeting was held at the Docks Exchange Hall on Jan. 19, when papers were given by Messrs. A. Thompson and W. Caine entitled "Recollections of the Telephone" and "From Firepot Boy to Faultsman" respectively. The papers proved most interesting and excellent

discussion followed each. The chair was occupied by Mr. W. E. Gauntlett (District Manager).

The sixth sessional meeting, which was a combined meeting of the two Swansea societies, was held at the Public Library on Feb. 9, when a most interesting and instructive paper was given by Mr. R. A. Dalzell entitled "Some Points .. Connection with Distribution (Traffic)." The members present numbered about 60, the chair being occupied by Mr. W. E. Gauntlett (District Manager). The lecturer in his paper emphasised the need for a complete study of the question before the distribution of lines in an exchange is attempted, in order that efficiency and economy may result. The value of various classes of calls and the percentage of efficiency of an operator covering one or more positions was illustrated by means of some excellent curves and diagrams. Several questions were afterwards put to the meeting and discussed.

Torquay.—The fifth meeting was held on Jan. 31. Miss E. J. Vanstone read a paper, "Some Notes on Operating—Past and Present." Special mention was made of the transfer of Torquay subscribers from the earth circuit to the present system and the difficulties of automatic-box operating. A discussion followed on the points raised.

Tunbridge Wells.—The second meeting of the session was held at the Dudley Institute on Jan. 17, when a lecture entitled "Telephonic Transmission" was given by Mr. F. W. Roberts, Local Manager, Brighton. An explanation of induction capacity and the theory of alternating currents led to the more interesting study of electrical wave propogation. Diagrams and oscillograms were shown by lantern and the various formulæ, culminating in that of the attenuation constant. A brief description of the practical method of application of the theory of wave length and distribution of inductance by loading coils.

The third meeting was held at Ralph's Restaurant on Jan. 26, when Mr. Laidlaw, of the Engineer-in-Chief's Office, lectured on "Common Battery Equipment." The diagrams shown included a designing form, which was explained. With the aid of lantern slides and diagrams Mr. Laidlaw showed the various types of common battery boards now in use, and also explained, with working models of a complete common battery equipment, the operation of the circuits. An interesting discussion followed.

Warrington.—The fourth meeting of the session was held on Feb. 16, when 43 members and four friends availed themselves of the opportunity of listening to two interesting and instructive papers. The first was given by Mr. A. Stewart, Assistant Engineer, of Manchester, on "Copper and Bronze," and the second by Mr. J. W. Dean, Contract Manager, Warrington, on "Advertising."

Western (London).—The usual monthly meeting of this society was held at Gerrard Exchange on Jan. 27, on which occasion Mr. W. A. Sullivan read a paper, "Miscellaneous Exchange Circuits." Several lantern slides were shown and described, and amongst others Messrs. F. M. Hall, W. Hills, A. Holmes and J. McLeish took part in the ensuing discussion.

Weymouth.—At the third sessional meeting of this society, which was held at Butcher's Restaurant on Jan. 27, an interesting paper was given by Mr. Attwooll, the Local Manager, dealing with "The Progress of Telephony in the Weymouth Sub-Centre," the speaker covering a period from 1887, when the Weymouth Exchange was opened by the Western Counties Telephone Company with twelve subscribers, to the present time, when the service embraces nine exchanges and 700 subscribers. Considerable amusement was caused by the description of the opening of the Weymouth to Portland junction service and the quaint remarks of the civic officials over the wires on that occasion. An interesting discussion followed.

Wolverhampton.—The postponed January meeting was held on Feb. 4 at of the Midland Café. Papers were read by Mr. R. W. Lloyd on "Maintenance Efficiency" and Mr. B. C. Saxton on "Rubber; its manipulation for commercial use." The first-named paper dealt generally with the items making for efficiency, especially exchange maintenance. The latter paper, starting with the collection of the crude rubber and the various countries of supply, dealt with all subsequent processes involved up to the complete manufactured articles on the market, having special reference to the vulcanising processes of cables used by the Company. Numerous samples were exhibited by the lecturer of the following classes of crude rubber:—Para, Cara, Pernambus, Marnho, Asiatic Assam, Pamang, and African Madagascar, and an interesting discussion followed. The chair was taken by Mr. J. Dring, Local Manager, Worcester.

NEWS OF THE STAFF.

Mr. CRAWFURD MILLAR of the Superintendent for Scotland's Office, Glasgow, has been promoted to rank as a District Manager.

Mr. A. MACLEAN who was transferred to the Thames Valley district in August last when the Birkenhead district was amalgamated with Liverpool, has been presented by the Birkenhead staff with a silver rose bowl together with a large photograph of the staff of his old district as a mark of their esteem.

On Jan. 17 Mr. R. C. BENNETT, District Manager, Sheffield, completed 25 years' service with the Company. In commemoration of this event he was presented by the staff with a tantalus suitably inscribed.

Miss G. DELANEY, Operator, Sheffield, has been transferred to Birmingham in a similar capacity.

Miss E. REYNOLDS, Chief Lady Clerk, district office, Middlesbrough, was presented with a gold bangle and brooch on resigning after thirteen years' service in the Company.

Mr. G. C. FEARN, Clerk, Nottingham Factory, was presented on Feb. 18 by the combined Factory and Engineer-in-Chief's staffs (N.F.) with a handsome kit bag and silver matchbox on the occasion of his leaving the service. Mr. A. E. Smith, Chief Clerk, made the presentation.

Miss A. B. MORRISON, Operator, Perth, was presented with a writing case on the occasion of her leaving the service.

Mr. H. WARREN, Inspector, Leicester, has been transferred in a similar capacity to Burton-on-Trent.

Mr. E. P. BETTS, Inspector, Burton-on-Trent, has been transferred to Leicester.

Miss GRACE RITCHIE, Assistant Teacher, Operators' Training School, has been appointed to Ibrox Exchange *vice* Miss RHODA SMITH, Chief Operator.

Mr. A. C. THOMSON, Rental Registers Department, Glasgow, has been appointed Storekeeper's Clerk in place of Mr. P. Y. MORRISON.

Mr. WILLIAM PATTERSON left the Glasgow district office on Feb. 3 for Cork, where he will take up the duties of Rental Registers Clerk. Prior to his departure he was the recipient of a gold albert in token of the appreciation and goodwill of his colleagues.

Mr. D. B. HEBENTON, Cash Clerk, has been promoted to the position of Clerk in the Rental Registers Department in place of Mr. WILLIAM PATTERSON.

Mr. A. S. BRODIE, Contract Clerk, Glasgow, has been appointed Chief Ceasement Officer; Mr. J. M. STEWART, Call Office Officer, Contract Clerk, Mr. CRAVEN, Clerk, has been placed in charge of call offices, and Mr. WM. STEWART has been transferred from complaints to contract office.

Mr. J. S. CHRISTIE, Contract Officer, Glasgow, when leaving for Canada, was presented by his comrades in the Contract Department with a fountain pen, pipe and other gifts.

Mr. J. MILNE, Instrument Fitter, Glasgow, has been transferred to Brighton as Test Clerk.

Mr. T. MACKENZIE, Wireman, Brighton, who was formerly Foreman, but was reduced owing to the falling off of work, has been transferred to London as Wireman.

Mr. L. G. MILES, Typist and Correspondence Clerk, Norwich, has resigned to accept an appointment under the Board of Trade at the Norwich Labour Exchange. Before leaving he was presented by the Chief Clerk on behalf of the staff with a dressing case as a token of esteem and good wishes from his late colleagues.

Mr. E. BETTS, Fees Clerk, Norwich district office, has been promoted to the position of Typist and Correspondence Clerk rendered vacant by the resignation of Mr. L. G. MILES.

Mr. J. C. JENKINS, District Office Clerk, Swansea, who was transferred to Gloucester in a similar capacity was on leaving presented by the Swansea staff with a silver cigarette case and a set of brushes. The presentation was made by Mr. W. E. Gauntlett, District Manager.

Mr. A. THOMPSON, jun., Linesman Inspector, Swansea, has been transferred Barry in a similar position.

Mr. E. H. DENTON, Inspector, Accrington, has been transferred to Warrington in a similar capacity.

Mr. H. ASHTON, Local Office Clerk, Accrington, has been transferred to the Instrument Department, Accrington.

Mr. H. E. WATERHOUSE, of the Portsmouth district office, who had been in the Company's service for thirteen years, was on his leaving for America presented by the district office staff with a cabin trunk as a token of their esteem. He was greatly respected and a general favourite and has taken with him the good wishes of all who came in contact with him.

Mr. C. G. HEIGHTON, Exchange Inspector, Swansea, has been appointed Chief Inspector, Newport, in the place of Mr. G. Field, transferred to Cardiff.

Inspector FINCH has been transferred from Cardiff to Newport in a similar position.

Mr. M. SULLIVAN, who has been employed by the Company for the past seven years at Newport, Mon, resigned his position to take up other duties with a local firm, when he was presented by Mr. R. Williamson, the Local Manager, on behalf of the whole of the staff at Newport, with a travelling bag as a token of the good feeling which existed.

Mr. S. E. GOODALL, Junior Clerk, Whitehaven, was recently successful in winning £58 11s. 6d. in a *Tit Bits* "Ditto" competition.

Miss LILLA ADELAIDE BEECHING (Ramsgate), upon resigning her position as Operator on account of ill-health, was presented with a dressing case (fitted) which was subscribed for by the whole of the Ramsgate centre staff.

Metropolitan Staff Alterations:

Mr. W. F. PILBROW, Clerk, Correspondence Department Salisbury House, has been transferred to the Statistical Office, Salisbury House.

Mr. R. W. WARE, Clerk in the Statistical Office, has been transferred to the Metropolitan Superintendent's Office.

Mr. A. E. STEVENSON, Fault Clerk, North, has been appointed Exchange Electrician's Clerk, Gerrard.

Mr. J. REVILL, Foreman Repairer, Hop, has been appointed Storekeeper, Streatham.

Mr. C. W. TREACHER, Inspector, Avenue, has been transferred to Paddington.

Mr. H. HARDY, has been appointed Assistant Engineer-in-Charge of Repairers.

Mr. J. PRESCOTT, Assistant Engineer, East, has been appointed Local Engineer, New Cross.

Mr. B. R. BUXTON, Engineer's Clerk, Paddington, has been made Local Engineer's Clerk, Hammersmith.

Mr. R. WILKINS, Clerk, Correspondence Department, has been transferred to the Contract Department, City.

Mr. F. ELLIS, Apprentice, has been appointed Temporary Engineer, Battersea.

MARRIAGES.

Miss LOUIE MURRAY, Operator at the Royal Exchange, Liverpool, resigned on Feb. 10 to be married. Miss Murray who was very popular among the staff received many handsome presents. The operating staff at Royal presented her with cutlery and among the gifts were a handsome brass afternoon tea kettle, silver plated hot-water jug, tea set, biscuit barrel and pair of fish carvers. The "Royalists" determined that Miss Murray should have a good "send off" subscribed for and ordered a taxi-cab, in which she rode home accompanied by her 28 presents—tokens of goodwill and wishes from her fellow-workers.

Mr. HAROLD W. STANDEN, Local Office, and Miss HILDA A. JONES, Senior Operator, Wigan Exchange, were married on Dec. 27, and on the occasion were presented by the Local Manager on behalf of the staff with a wicker chair and Sheraton table.

Miss GEORGINA MITCHELL, Operator, Middlesbrough Exchange, was the recipient of a dinner service on resigning the service, Jan. 20, in view of her approaching marriage. Mr. W. A. Nicholson, Local Manager, made the presentation on behalf of the staff.

Miss LILIAN HIRON, Senior Operator at Derby, resigned the service in order to be married. She was presented with a china tea service, and in making the presentation Mr. Young, the Local Manager, voiced the good wishes of her colleagues for her future happiness.

Mr. F. HUNSLEY, Inspector, Sheffield District, was presented by the Sheffield staff with a dinner service on the occasion of his marriage on Feb. 15. The presentation was made by Mr. F. Barr, Local Manager, on behalf of the staff.

Mr. L. COUSINS, District Office Clerk, Exeter, was presented with a marble timepiece, subscribed for by the Exeter staff, as a token of regard, and to commemorate his recent marriage. The presentation was made by the District Manager.

Mr. P. Y. MORRISON, Storekeeper's Clerk, Glasgow, was recently married, and on Jan. 25 he was presented by his fellow-workers with a handsome timepiece with side ornaments. Mr. Anderson, Chief Clerk, made the presentation. It is further proof of the proverb, "Fortune favours the brave," that since his marriage Mr. Morrison has received promotion, having been appointed Storekeeper in the Edinburgh district. He carries with him the best wishes of his many friends in the Glasgow district.

Miss ALICE M. FARNHAM, Operator at Tunbridge Wells Exchange, left the Company's service on Dec. 30 to be married. She was presented by the staff with a dinner service as a token of esteem.

Miss ALICE A. PARAMOR, Operator at Southborough Exchange, left the Company's service on Jan. 13 to be married.

Miss MAUDE EVELINE CASHFORD, of the Operating staff, Margate, was presented with a copper kettle on stand with spirit lamp and a copper crumb tray and brush on Jan. 29. The Local Manager who made the presentation expressed, on behalf of the staff, the good wishes of all for her happiness in the married state, to enter which she is leaving the Company after three and a half years of service.

Mr. E. HARREY, Assistant Cashier, Manchester, was presented by the staff on the occasion of his recent marriage with an inlaid mahogany music cabinet.

OBITUARY.

We regret to record the death on Feb. 6 of Mr. ROBERT BONNYMAN, Stationery Clerk at Edinburgh. He was a lad of much promise. The sympathy of the staff for his family was shown by the number who attended the interment and by two beautiful wreaths.

We regret to report the death of Miss MAUDE WILLIAMS, Operator, Accrington, which took place on Jan. 31. She retired from the service in November last, having been in poor health for some time previous. She was well liked and respected by all members of the staff, who were much grieved at her demise.

We are very sorry to have to record the death of Mr. W. S. GORRINGE, Night Operator-in-Charge, Battersea, which occurred on Jan. 20 at St. Thomas's Hospital, following an operation for internal trouble. He had been in the Company's service for the past four years and was much esteemed by his chiefs and staff and all those who came into contact with him.

We regret to have to report the rather sudden death from meningitis of Mr. F. LITTLE, District Office Clerk, Warrington, which took place in the Warrington Infirmary on Jan. 6. He joined the Company's service at Brighton on Jan. 19, 1905, and was transferred to Warrington on June 28, 1909. He spent the Christmas holiday at Brighton and returned to duty on Dec. 29, but had to stay away on Dec. 30, and died as stated. He was 22 years of age.

Mr. THOMAS DEIGHTON, Foreman, North, died on Feb. 17 of pneumonia. He entered the service on Sept. 15, 1886.

STAFF GATHERINGS AND SPORTS.

Paisley The annual dance of the Paisley staff took place in the G. A. Clark Town Hall on Thursday, Feb. 3. Forty-five couples took part, among whom were several members from the district office, Greenock. The duties of M.C.'s were creditably performed by Messrs. Livingstone and Whyte. The dance was most successful, and broke up at 2.30 a.m. with the singing of "Auld Lang Syne."

Brighton.—The second whist drive of the season, arranged by the Brighton staff, took place at Forfar's Restaurant on Jan. 27. There were 64 players, and the prize-winners were as follows:—Ladies: First (jewel case), Miss Burden; second (rose bowl), Miss Welling. Gentlemen: First (bronze inkstand), Mr. F. Tyler; second (trump indicator), Mr. Snelson. Mr. C. F. Moorhouse (District Manager) was present, together with Mrs. Moorhouse, who kindly presented the prizes. The officials were Mr. H. Drury (M.C.), Mr. P. Prudden (dance M.C.), Miss Webb, Miss Agutter and Mr. E. J. Clarke. The gathering broke up at midnight after a very pleasant evening, the last hour being devoted to dancing.

Newport.—The Newport staff held a successful whist drive and dance at the Savoy Hotel on Jan. 28, when they were joined by several of their friends from the Cardiff district staff, and members of the Engineering and Traffic Departments of the Newport Post Office. Whist was played from eight o'clock to 10.30 p.m. and then dancing was kept up until two o'clock. Mr. R. Williamson, Local Manager, acted as M.C. in the unavoidable absence of Mr. A. G. E. Payne through illness, and Mrs. Williamson presented the prizes. The arrangements were admirably carried out and a very enjoyable evening was spent.

London.—The fourth annual "Gerrard social" took place on Feb. 11 at the Finsbury Town Hall. Over 200 were present, including Mr. C. B. Clay and Mr. Harvey Lowe. A very good programme had been arranged by the committee, comprising singing, dancing, and also a short sketch, the parts being taken by members of the Gerrard operating staff. The special feature of the evening was some very fine classical dancing by a member of the staff (Miss F. Rout), which met with a very good reception. The duties of M.C.'s and stewards were carried out by Messrs. C. F. Arrowsmith, E. How, E. Drabwell and E. S. Coombe. The programme, which consisted chiefly of staff talent, terminated at midnight after affording those present a most enjoyable time.

With the permission of the Traffic Manager the Streatham staff were enabled to hold their first "at home" at the new exchange, on Feb. 12, from 3 p.m. to 5 p.m. Nineteen guests were entertained, being principally the parents and relatives of the operators, who were shown over the premises by the Exchange Manager for the Battersea district. Very great interest was shown by all in the equipment of apparatus and switchrooms, and appreciation was expressed by them at the extremely comfortable quarters provided by the Company for the operating staff.

Swansea.—The third annual whist drive and dance was held on Feb. 4 at the Hotel Cameron, when a large gathering of the staff and friends, numbering in all about 120, spent a most enjoyable evening. Included amongst those present was Mr. W. E. Gauntlett, District Manager, who was accompanied by Mrs. Gauntlett. The first part of the evening was devoted to progressive whist, the prizes being presented to the winners by Mrs. Gauntlett. Dancing commenced at eleven o'clock and was continued until 3 a.m., a number of fancy dresses lending delightful colour to the function. All present voted the gathering a huge success and the committee, Messrs. C. A. Bevan, H. G. McArthur and J. Radford, are to be congratulated on the results of their efforts.

Reading.—A successful whist drive, promoted by the lady members of the staff was held at Ye Talbot Café, Reading, on Feb. 16. A very enjoyable evening was spent by 116 ladies and gentlemen. The prizes were distributed by Mr. Maclean, two of them being won by members of the staff. Great credit is due to Miss Rawlings, Clerk-in-Charge, who acted as M.C., and the other ladies who assisted her, for the able manner in which the drive was conducted.

Tunbridge Wells.—On Feb. 5 a football match was played at Tunbridge Wells between teams representing the Tunbridge Wells and Chatham staffs. Notwithstanding the unfavourable weather and a heavy ground, a good game was witnessed, which resulted in a win for the home team by 5 goals to 2. After the match the visitors were entertained to tea, followed by a smoking concert.

Edinburgh.—The first annual supper of the district staff took place in the Central Hotel, Princes Street, Edinburgh, on Feb. 11. Mr. D. McIntosh, District Engineer, presided in the absence of Mr. Gilmour, District Manager. Seventy, including employees and friends, sat down to supper. A large and varied musical programme was submitted, the members of the staff who contributed including Messrs. J. Bald, J. McStravick, J. Pirie, W. Fraser, W. Weston, T. Crawford, W. Wilson, A. Stirling, W. Tait and J. Milne. Several friends also contributed, including Messrs. Aikman, Swanson, Wilson, Black, Collins, Hutchison, Watson, Purdie and Gillespie. Mr. Wilson, Chief Clerk, proposed the toast of the "Visitors" in a happy vein. Mr. Herschell (Post Office) replied, and spoke of the good feeling which had always existed between the Post Office and the Company's staff locally. A very enjoyable evening was spent, and the proceedings closed at midnight with the usual "Auld Lang Syne." The arrangements were carried out by Mr. Alex. Lumsden, Traffic Manager.

Dundee.—The annual dance took place on Jan. 28 in the Royal Hotel, when about 55 couples took part. In the course of the evening Mr. Brown, District Manager, made a few remarks on the progress made during the past year. The gathering was a very successful one, and was perhaps the most enjoyable ever held, reflecting great credit on the M.C., Mr. D. B. Greig, and the committe who supervised the arrangements.

Newcastle-on-Tyne.—A smoking concert was held at the Crow's Nest Hotel, Barras Bridge, Newcastle, on Feb. 11. The president, Mr. J. Gwyther, was in the chair, and over 70 members and friends were present. The programme was under the direction of Mr. J. E. Jordan, who was ably assisted by the Gosforth Glee Society (conductor, J. Hobkirk), Messrs. Finn, Westwood, Ted Cryer and W. McAllister. The staff was represented by contributions from Mr. M. T. Byrne, who gave some real topical humour. His reference to the society and telephone matters added to the mirth of the evening; as did the contributions of Messrs. J. Hamilton, R. Dryden and J. Markey. A vote of thanks to the artists and chairman brought to a close a very enjoyable evening.

Truro.—The staff of the National Telephone Company held their first annual whist drive and social on Jan. 14 at the Concert Hall, 110 members and friends being present. The prizes at the whist drive were won by the following: Gentlemen—1, Mr. Lear; 2, Mr. Truscott. Ladies—1, Miss Mewton; 2, Miss Lander (N.T.C., Helston). The whist drive was followed by singing and dancing.

Luton. The annual social evening was held in the Franklin Rooms, Luton, on Jan. 20. Fifty members of the staff, with friends, were present, and spent a very enjoyable time.

Torquay.—The first social evening in connection with the telephone society was held at the Struben Hall on Feb. 4. Cards, music, dancing and an excellent supper made up an enjoyable evening, which was much appreciated, and thanks are due to the committee who carried out the arrangements in so thorough a manner. Opportunity was made at this gathering to present to Miss Vanstone, Clerk-in-Charge, a handsome marble clock, subscribed for by the Torquay staff, to mark her forthcoming marriage and as a token of esteem to commemorate her years of service at Torquay.