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TELEGRAPH AND TELEPHONE MEN AND WOMEN.

XXIII.—

COMMANDER F. G. LORING,
R.N., M.I.E.E.

COMMANDER LORING was born in 1869, and entered the Royal Navy in 1882. He was serving as a Lieutenant in *H.M.S. Victoria* when, in 1893, she was rammed and sunk by *H.M.S. Camperdown* in the Mediterranean. Commander Loring was awarded the Medal of the Royal Humane Society for saving two lives on that occasion.

A few years later he qualified as a Torpedo Lieutenant, and in 1902 was appointed to the Admiralty as Officer in Charge of the Naval coast wireless stations in this country.

In 1908, when the Post Office took over the control of all commercial coast wireless stations, Commander Loring was appointed to the new post of Inspector of Wireless Telegraphy, and in 1910 retired from the Naval Service.



In 1906 he acted as an Admiralty delegate at the first International Conference on Wireless Telegraphy, held at Berlin, and in 1912 as a Post Office delegate at the Conference held in London. In 1914 he acted as technical adviser to the Board of Trade on wireless matters at the International Conference on the Safety of Life at Sea, and has represented the Post Office on most of the numerous inter-departmental committees on wireless telegraphy.

At the present moment Commander Loring is acting as Secretary to the Committee on Imperial Wireless Services, which, under the Chairmanship of Viscount Wolmer, M.P., is arranging for the new wireless services with the Dominions and India.

Commander Loring has brought from his Naval work to the dusty atmosphere of our office a breath of the open sea, laden, as his staff well know, with an outlook which is fresh, generous, and broadminded.

INTERNATIONAL TELEGRAPH CONFERENCE OF PARIS, 1925.

RANDOM REMARKS.

THE International Telegraph Conference of 1925 terminated its work on Oct. 29, after a session lasting two months. The Administrations represented comprised 65 members of the Telegraph Union. Representatives of 13 other countries and of 44 Cable and Wireless Companies were also present with power to speak but no right to vote. The delegates and attachés present numbered nearly 300.

Great Britain's team consisted of:—

Messrs. J. Lee (Chairman of the Delegation) and E. E. Street, of the Central Telegraph Office.

Messrs. F. W. Phillips, F. H. S. Grant, H. G. Trayfoot, and J. Loudon of the Secretary's Office.

Messrs. F. Strong, J. M. Goodman and H. E. Boyce of the Accountant-General's Department, and

Mr. J. A. V. Echevarri of the Wireless Telegraph Board.

The Conference sub-divided its work among five commissions, and, while overlapping of Committee sittings was avoided so far as possible many concurrent sessions were necessary, especially during the later half of the Conference. Some nations, whose delegates were few in number, were, for this reason, unable to nominate representatives to assist at some of the discussions.

The International Conference included among its members some charming and striking personalities and many different types of mind. The strict logician, the master of detail, the student of precedent, the skilled draughtsman, the resourceful diplomat, the optimist, idealist, realist, humourist and orator, the operator, technician and administrator were all present, and each made appropriate and effective contribution to the common work.

The broad principles of international telegraph and telephone working are governed by the Convention of St. Petersburg of 1875, a document in the nature of a treaty signed by diplomatists, which cannot be varied save by a new treaty. The detailed telegraph and telephone regulations are contained in a Règlement which has been revised by successive international Conferences held at intervals, normally of 5 years, between 1875 and 1908 (Conference of Lisbon), since when there had been no Conference.

Methods and alternative means of communication have changed much in this interval of 17 years, while costs have largely increased, with the result that the Conference of Paris was not able to make resounding reductions of rates. However, the Conference tussled long and courageously with the problem of restricting within the narrowest possible limits any necessary raising of tariffs, with the final result that—at any rate so far as the British public is concerned—when due allowance is made for the reduced purchasing power of money, the tariffs proposed are below the pre-War level, and, in many cases much below.

Two months may seem a long time to spend in preparing a fresh Règlement, but it must be borne in mind that the Conferences of the Telegraph Union are the sessions of the Legislature in international telegraph and telephone matters, and that the proceedings of all well-ordered legislative bodies are necessarily deliberate. Formalities and checks have to be observed and all points of view must be given a full and patient hearing, if decisions are to command respect and support. The delegations at these Conferences represent independent administrations, and any attempt to over-ride a minority by mere out-voting would result in the use of the "veto," and, ere long, disruption of the Union. Sovereign administrations will not accept dictation in matters of fundamental importance. Each delegation must therefore constantly exercise patience, restraint and discretion, and above all, bear sympathetically in mind the points of view, problems and special difficulties of other administrations.

Reference has been made above to the "veto." The Règlement prepared by a Conference becomes of no effect if a single member of the Telegraph Union notifies inability to ratify the document. Accordingly, to prevent the labours of the Conference being rendered completely nugatory by non-ratification, any delegation has the right during the Conference to indicate by formal reserve or veto that its Government will not be able to ratify a given proposition. Such a notification gives the Conference the opportunity to modify the proposal to which objection has been raised or to exclude the dissenting Administration from its operation or to take other appropriate measures to meet the situation. The exercise of the veto is, of course, a very extreme step warranted in very exceptional circumstances only.

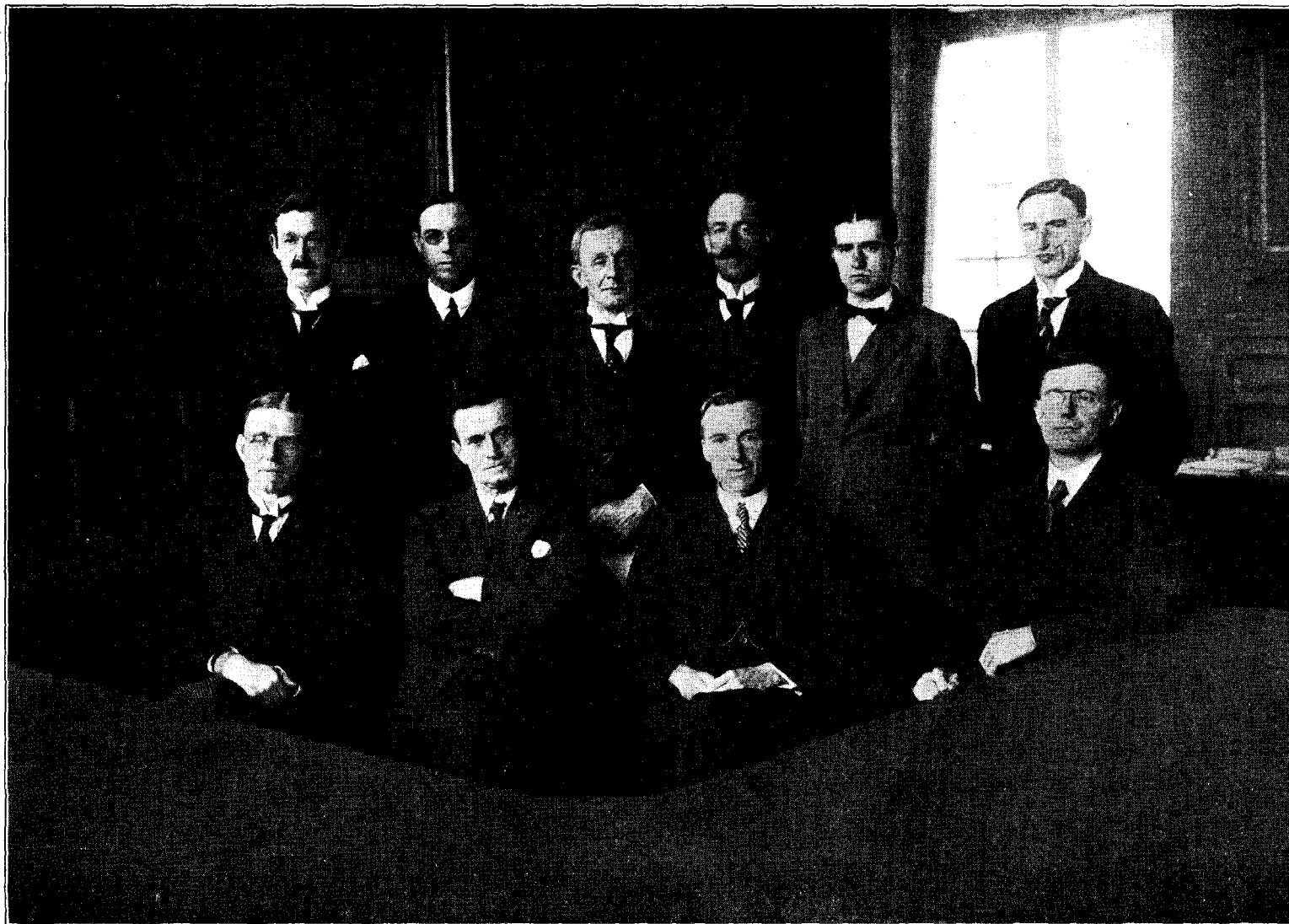
There were nearly 1,200 propositions on the printed Agenda, and—as stated above—these were sub-divided between commissions reporting at intervals to the Conference sitting in "séance plénière" which reviewed their recommendations and finally gave a first and second reading to the text of the revised Règlement. The five Commissions were presided over by the heads of the Belgian, British, French, German and Indian delegations. Each delegation, whether or not represented on any particular commission, had the right to discuss or re-raise any point at each stage, with the result that there were about 50 sessions of the Commissions, besides many less formal meetings. It cannot, therefore, be regarded as surprising that the proceedings should last for eight or nine weeks.

The proceedings relating to Telephones are described on page 31 of the November issue of the *Telegraph and Telephone Journal*, and doubtless a summary of the Telegraph side will also be published. The last paragraph of the article referred to explains the manner in which every detail of the day-to-day working of the international service came under review. It is probable that one of the main differences between the Paris Conference of 1925 and its predecessors lies in the fact that this time a much larger part of the necessary detail work was accomplished by intimate informal discussion between the men responsible for day-to-day working of the service, a procedure which could scarcely fail to yield valuable results, direct and indirect.

By universal admission Paris is an admirable meeting-place for an International Conference. The French Government extended to the delegations a cordial welcome and generous hospitality. The delegates maintained the utmost friendliness, notwithstanding great divergencies of views upon many points of capital importance. During the discussions the British delegation was not infrequently in a minority of one, and can bear grateful testimony to the courtesy and forbearance of other delegations. It was a French representative who proposed to the Conference that the chief German delegate should be president of one of the most important Commissions, while a German delegate proposed a similar honour and responsibility for a French representative. The sternest opponent of priggery cannot deny that, in some measure, a member of an international conference is, willy nilly, an unofficial ambassador; and it was not possible for a careful observer to doubt that the sincere friendliness and cordiality mutually displayed in speech and deed for so many weeks by representatives of nations until recently in bitter opposition had and must continue to have an influence far beyond the realm of matters telegraphic.

A charm was added to Conference life by the fact that the deliberations of its Commissions took place in the Palais de la Sorbonne, the seat of the University of Paris, with its memories of St. Louis, his chaplain its founder in the 13th century, and of Richelieu, its rebuilder and powerful supporter two and a half centuries later.

The Conference was not, any more than life at home, all sustained labour. The Paris Government was liberal with banquets, excursions and entertainments generally, while there was also much mutual hospitality between the delegations. Some delegates found, or claimed to find, the numerous dinner engagements rather trying to the digestion, but there was, nevertheless, a goodly attendance at all such functions. There is naturally a tendency to fall back on Conference topics for conversation, and delegates were not altogether off duty even when dining. After-dinner speeches were



H. G. TRAYFOOT. J. M. GOODMAN. E. E. STREET. H. E. BOYCE. J. A. V. ECHEVARRI. F. STRONG.
J. LOUDEN. J. LEE. F. W. PHILLIPS. F. H. S. GRANT.

few and short, to the great satisfaction of nearly all the speakers and of all the listeners.

At Fontainebleau, Versailles, and elsewhere the Conference was accorded a formal reception by the municipality. These ceremonies included speeches of welcome and compliment, champagne and other refreshments, including tea. (The notion that good tea is unobtainable in France is entirely out of accord with modern fact.) It is to be feared that visitors to England do not always experience this type of municipal hospitality.

Sorbonne is very near the charming Luxembourg Gardens, to the Panthéon, Notre Dame and the River. The mid-day interval between the morning and afternoon sessions could thus be very agreeably bridged. The British delegation stayed near the Opéra, and the journey twice a day through the heart of Paris across the Seine to and from the Sorbonne could be varied in very many ways. The beauty of Paris from the bridges has been described too often to warrant more than a passing reference here, and though the reader may tire of oft-repeated eulogy the eye of the beholder does not weary of the Seine's variety.

Outwardly, perhaps the most indefatigable man at the Conference was the photographer, without whose constant apparition and ministrations no function was complete, while his ritual with hat and flare added much to gaiety. The British delegation was not very fortunate in any of its many appearances before the camera, but, in fairness, it remembers that few people relish realism applied to themselves. Doubtless in the scheme of things, the disciplinary effect of being made to see ourselves as others see us is good.

No account of a visit to Paris, officially or unofficially, is supposed to close without some reference to the language question

and the street traffic. The discussions of the Conference were entirely in French, which occasioned little difficulty to the majority of the delegates. One of the few, however, who knew very little of the language was so conscious of the inadequacy of his French that when a stranger in the street addressed to him a question in *English*, he answered automatically "I don't speak French."

The motor traffic in Paris is fast, vast and noisy, but under very good control of driver and police. The taxis are small and very numerous, although not always available in the places and at the times desired. There appears to be some traffic rule to prevent local congestion. Taxi fares are one of the few really cheap things in Paris. Their drivers are remarkable not only for their skill and nerve but also for their audacity in cutting through a line of traffic. Bearing in mind the world-wide reputation of cabmen for irascibility and volubility, the mutual tolerance and forbearance displayed by the taximen was most striking. The taxis are speedy and nearly all fitted with 4-wheel brakes, but they do not always arrive at their destination, and their structure is not in all cases very sturdy, as we more than once saw rear wheels shed, while one of the delegates had to pay compensation for pulling a large piece out of his vehicle in an effort to lower a window.

One of the last duties performed at a Conference is to decide where the next shall be held. Both Belgium and Poland extended invitations for the 1930 meeting. After some discussion Poland gracefully deferred to certain special claims of Belgium, the more readily as the year 1930 will mark the 100th anniversary of the independence of Belgium, and Brussels, therefore, will see the next Telegraph Conference.

F. H. S. G.

LONDON TELEPHONE SERVICE.*

By M. C. PENK.

(Continued from page 40.)

It will be remembered that when the local tariffs were modified, increases were made in the trunk charges. The scheme for increasing the trunk charges involved, however, a revolution in the method of computing the charges. The country was divided up into one mile squares which could be identified by their distances East and South of certain datum lines. Up to the time of the change the country had been divided into fairly large trunk areas, and each exchange in any area derived its charges from those of the principal exchange in the area, which was known as the Trunk Centre. Under the new scheme every individual exchange, with the exception of certain exchanges in the centres of the very largest cities, had its own charge schedule with separately calculated charges to every other individual exchange. The amount of work which was entailed in preparing for the introduction of this system was exceedingly heavy. Although in the London area all the exchanges within a 5 mile radius of Oxford Circus shared a common charge schedule, we had to make about 44,000 map measurements, and to work out on the basis of the mile squares a further 10,000 calculations. The results of these measurements and calculations had to be entered up in individual exchange price schedules, and a sufficient number of the individual schedules had to be ready to ensure that no delay would arise in the pricing of trunk tickets on the introduction of the new tariffs. The provision of the nucleus pricing schedules alone involved about 300,000 entries. Various methods had to be devised to cut down the clerical and calculating work involved. It was possible, for instance, to provide a key diagram showing the general form of the boundary lines between charging zones. These boundary lines could not be purely radial as they had to follow the contours of the various individual squares. With this key used in association with a chart showing all the London exchanges in their appropriate squares, all the charges from any provincial exchange to the exchanges in the London area could be derived without actual calculation. Fig. 10 is an example of the London chart

LUTON
538 566

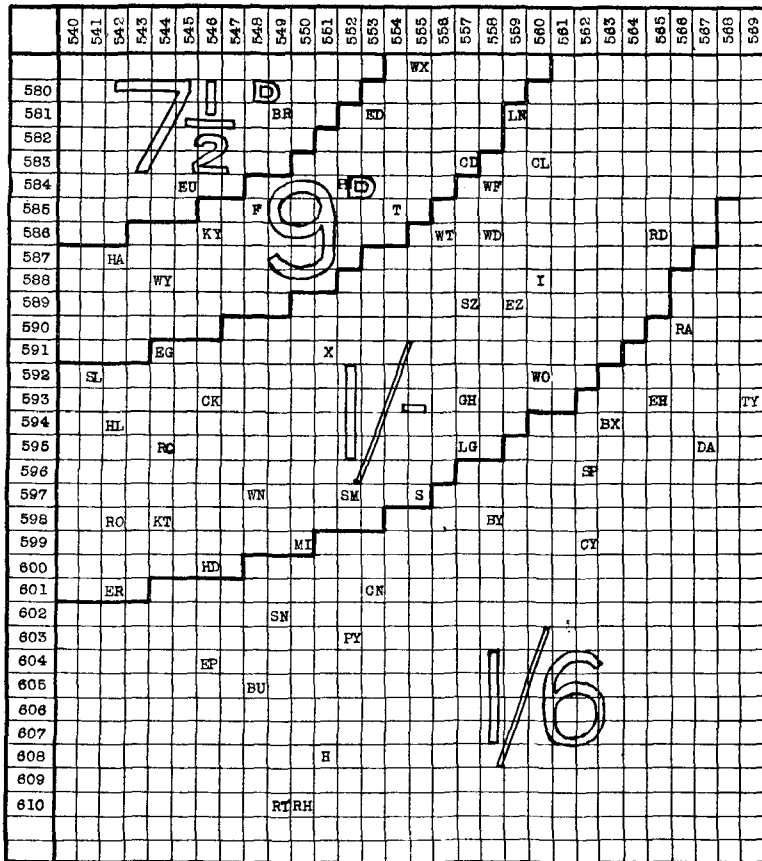


FIG. 10.

X REPRESENTS THE CENTRE OF THE 5-MILE CIRCLE.

* Paper read before the Telephone & Telegraph Society of London.

as applied to the case of Luton. In spite of this and other short cuts, it was necessary to augment the work of headquarters people by a staff of 22 individuals drawn from the Trunk Exchange, and devoting their whole time for many weeks to this work.

The amount of weekly revenue derived from trunk traffic proper varied between maxima of £13,800 in June, 1921, and £16,400 in July, 1925, and minima of £9,600 at Whitsun, 1921, and £12,400 in August, 1925. In spite of the drop in traffic which followed the introduction of the new tariffs the marked increase in the average charge per call caused a rise in the overall revenue. The average revenue received per trunk call is about 3s. 6d. and per toll call about 7½d. The high average value of the trunk call under existing conditions is sometimes not realised.

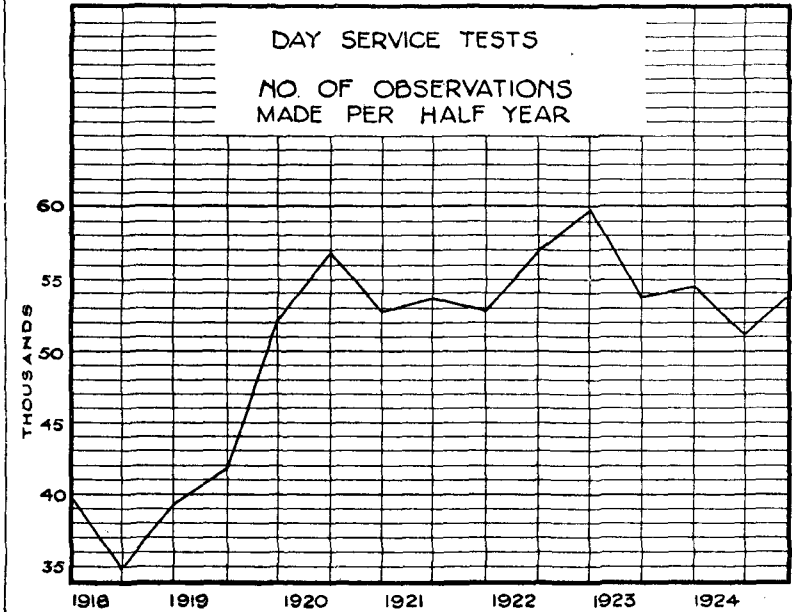


FIG. 11.

A study of the probable volume of long distance and toll traffic that will have to be handled in the London area 20 years hence, if development continues without serious check, forces one to the conclusion that methods will have to be devised which aim as far as possible at devolution of control and simplification of operating, with resulting economy in switchboard positions. The present Toll Exchange is a step in this direction, and when the new Toll Exchange is brought into use it would be possible to distribute some of the control of toll calls to the originating local exchanges. This course would naturally simplify the work of the Toll Exchange to a very much greater extent than has been possible in the past.

I should now like to turn from the question of traffic volume to some of the problems of staff. The number of staff of all grades in the exchanges before the War has increased from 5,667 to the present figure of 8,430, there being an increase in the number of telephonists from 4,306 to 6,137.

The drop in traffic during the War had been accompanied by very large staff losses, and the traffic recovery after the Armistice could only be met by the recruitment of new staff. The inexperience of this staff necessitated the recruitment of a larger number of telephonists than would have been necessary if the staff were fully trained. These conditions gave rise to many periods of anxiety in the Telephone Service, but they were exceptional, and I am not dwelling on them. I should, however, like to refer to the magnitude of the recruiting work during more normal periods. During 1921 no less than 9,315 girls were interviewed in connexion with the requirements of the telephonist establishment. It was only possible to pass 1,862 of these, and 1,711 were eventually proved to be entirely satisfactory, after passing through the telephone schools. In addition 1,209 girls were interviewed for girl probationerships, and 256 took up duty. The responsibility for the selection of suitable candidates—and the rejection of those who are likely to prove unsuitable—is a most important one. It is performed most efficiently in the Department of the Superintendent of Female Exchange Staff in London. Very few difficulties arise out of the decisions of the officers of that department, and the work done is worthy of the highest praise.

In order to facilitate the training of the exchange staff, we have designed a new training school. It was housed in the Clerkenwell building, and was brought into use in January, 1923. With this school it is possible to give satisfactory training to 120 people at one time. It compares very favourably with any other telephone training school in the world, and we are always willing and anxious to have visitors who can see for themselves what is being done to prepare the new operating staffs for efficient service. The switchboard in the practice room possesses all the characteristics of a full sized exchange, and close acquaintance with a detailed board of this type has a distinct psychological value when the learners who have passed through the school

are transferred to the public exchanges for their final training. Since the new school was opened in 1923, it has trained 2,933 day telephonist learners, and 692 night telephonists; and 795 officers of other grades have received some measure of instruction.

Since the end of 1918 we have had to recruit no less than 1,734 men for the night staff. As the whole night establishment is only of the order of 1,000 people, it will be clear that the turnover has been very heavy. Part time men leave for all sorts of reasons at short notices, and frequently all our recruitment and training resources have been employed solely to replace the wastage through resignations. It has been possible to effect some improvement in the efficiency of the night staff by employing a certain number of men between 6 and 8 p.m. These men have to meet the same conditions as those handled by the more highly trained day telephonists, and there is no doubt that the practice has had good results.

I have given you some idea of the volume of traffic which the London Telephone Service has to handle, and the magnitude of the staff problems in connexion with the handling of the traffic in the exchanges. It is obvious that if all this work is to be conducted smoothly and efficiently the employment of a higher controlling and directing force is necessary. For this purpose we have Traffic Superintendents and Asst. Superintendents, who have no direct responsibility for supervising the staff in the day-to-day handling of traffic, but are expected to study the general traffic problems of their particular exchanges or areas, and to see that the requirements and standards of headquarters are maintained. This general control can only be maintained by the use of extensive and efficient systems of statistics. The loads of individuals have to be measured and equalised as nearly as possible, and a reasonable degree of efficiency has to be maintained consistently throughout all the exchanges.

The methods of measuring the loads handled in an exchange have been described in previous papers given to this society, and I will only briefly recapitulate. An answering or "A" telephonist who deals with subscribers' demands is receiving calls of two general classes; calls to other subscribers on her own exchange and calls to subscribers on other exchanges. The calls in the second class are operated under varying conditions. Some go to an exchange which requires two, three, or more telephonist to handle the incoming traffic from the calling exchange. Others will be passed to an exchange where one telephonist only is employed on the route concerned. Others still will go to exchanges to which the volume of traffic is so small that it can be combined with that from one to three more exchanges, and handled by one operator. Another class of call may pass over junctions, upon which it is necessary to signal the distant operator in the first instance. All these varying conditions introduce variations in the amount of time that has to be spent by the answering operator. The methods of handling calls are standardised, and it is known that any call of a given type can be given a particular value, but the difference between the individual exchanges with regard to the amount of traffic handled under the different methods of operating are such as to require a periodical analysis of the traffic at each exchange, and the determination of a composite load valuation based upon that analysis.

Somewhat similar variations in the conditions under which the incoming traffic is handled necessitate frequent reviews of the arrangements of incoming junctions.

Having measured the amount of traffic handled and provided for the proper staffing of the exchanges, it is necessary to see that a proper measure of service efficiency is maintained. Our desire is to observe the service actually given to subscribers, and to know at any time the quality of the service given on any exchange, and the respects in which it differs from agreed standards. This can be done either by visiting subscribers' premises and making actual calls or by observing at special centres the calls passed in practice by subscribers whose lines are temporarily connected to those centres for observation purposes. The latter course is followed wherever possible, and by far the greater number of observation records are taken at the centres.

Fig. 11 shows the number of calls observed in the London area each year since 1918. Although it is obvious that this number forms only a very small part of the traffic actually handled, it is found in practice that the number of observations made gives a sufficiently reliable indication of the general conditions.

The results obtained at the observation centres are carefully analysed and tabulated for each exchange. The principal features of the service are issued to all exchanges monthly, and I am glad to say that the keenness of the exchange staffs is such that the issue of preliminary figures showing the results up to the middle of each month, in order that the exchanges may see how they are tending, is fully justified, and is very much appreciated by the officers immediately responsible for service.

The main summary of each month's observations is printed, and issued for general information, and the monthly results are further summarised into six-monthly results. The latter form an excellent basis for judging the stability of the service at any exchange and the general tendencies.

It would be quite impossible to deal to-night with all the features which are included in the general observation scheme, but I should like to pick out just a few of the general items relating to the London service as a whole. The service comes in for a good deal of criticism from time to time in the Press, although I think the public are really thinking better of us nowadays than they did a few years ago.

We put quality of service before speed, but it is most necessary for attention to be paid to speed, as there is no doubt that the person who has

to wait for the operator in the first instance starts with a bad impression of the service.

The average time taken by telephonists to answer has according to our half yearly records varied considerably since 1912. The time was improving up to the commencement of the War, when it reached $4\frac{1}{2}$ secs., and it continued to improve until, owing to the development of War activities in many fields, our staff wastage became very heavy. At the beginning of 1919 the traffic was, as you have seen, returning rapidly, but it took some time to overcome staff difficulties, and the answering time rose to over 10 secs. There was, however, a comparatively rapid improvement in the speed of answer (it was below 6 secs. in 1920), and although there has been a slight setback, the improvement is again in operation, and we are now giving an average answer of round about 5 seconds.

The average, may of course, be made up of many very speedy answers combined with a number of slow answers. These latter are most trying to the public, and in order to try and cut out the longer waits, we make a practice of measuring the percentage of calls answered within 5, 10, 20, &c. seconds. The most valuable of these is the percentage of calls answered in 10 seconds or less. Before the War the London figure had risen to 93%. With the degradation of service in 1919 the figure fell below 80, but it soon returned to the neighbourhood of 90. The last monthly figures available suggest a return to a figure above 90%.

The average time to clear the connexion at the end of a call in London is subject to conditions which are very similar to those in the speed of answer. The present average figure is about $5\frac{1}{2}$ seconds.

When a subscriber is in trouble he is asked to call the telephonist into circuit by moving his receiver hook up and down, and thus flashing his supervisory signal. The time taken to attend to such signals is round about 9 seconds. It is most important that these signals should be answered promptly; but as they are received on connexions which have already been set up by an individual operator, it follows that only that operator is in a position to answer the flashing subscriber, whereas in the case of fresh calls, the calling signal may be answered at several points. This fact, coupled with the condition that it is sometimes not immediately apparent to the telephonist that the subscriber is desiring to call her into circuit, accounts for the somewhat slower answer to supervisory signals than to calling signals in the first place.

A very good guide to the standard of service which is being given by any administration is the percentage of completed calls. This figure (83%) is now higher than at any previous time in London. This item is materially affected by the proportion of calls which fail owing to a subscriber's line being engaged. The elimination of the flat rate and the reduction of the calling rate which followed this step, led to a marked reduction in the number of engaged calls, and this, coupled with an intensive effort on the part of the contract officials to bring home to the subscribers the evil results of overloaded lines, have led to the present happier conditions. With the service improvements which were made after the merger with the Company in 1912, the percentage of engaged calls was reduced from nearly 18 to about 16, and although it got back to more than 18% during the period of the traffic rush after the War, it is now down to the remarkably good figure of 12%. The figures for the months of the second half of this year have so far shown even better results.

Much criticism has been levelled at the Post Office in connexion with wrong numbers. We all agree that we should like to do better than we have so far been able to do, but we have to face facts, and we know that the complex conditions of a system like that in London will never permit an efficiency of 100% in either plant or human results.

Our worst stage was in 1919 when we reached a percentage of 4.7%. Our best figures were 3.2% (1915) and 3.3% (1923), and although we dropped back a little way at the beginning of last year we again improved. Although the last complete half year shows a figure of 3.8 it is encouraging to think that the figure for August was 3.2 only, i.e. the equivalent of the best six monthly period ever obtained.

I think on the whole the service efficiency in London may be regarded as reasonably satisfactory. To maintain the present standard, and to improve on it as everyone in London desires, we have to bear in mind that a real live interest must be maintained, and that certain basic essentials must be secured. Among the most important points I would include:—

- Efficient plant and maintenance:
- Skilful traffic distribution:
- Contented staff:
- Efficient staff:
- Sufficient staff:

In connexion with the last point, it will have been clear from the nature of the traffic increases shown in the charts that we should soon be overwhelmed unless we assumed the deliberate policy of training staff in advance of the actual requirements. Owing to the limitations of our training organisation, it is necessary to spread the training out over an extended period. This means that the recruitment and training programme has to be drawn up a long way in advance of any anticipated traffic rise. This is where our imagination and our ability to foretell events are very severely tried.

The value of statistical information is obvious in connexion with all business, but there is probably no other business in which at the present time action which affects the expenditure of very large sums of money on establishment charges has to be taken at such short notice.

I have dealt so far with the London Telephone Service as it is at present. It must, however, be remembered that we are endeavouring to live, as it were,

in two worlds, and as is usual in such cases, we are not yet getting the best of either. Our second world is the automatic sphere, and I should like to refer briefly to the work of preparation for automatics that is going on.

The adoption of the policy of automatic development necessitated an alteration of certain exchange names and many subscribers' numbers. We have now changed seven names without encountering any serious opposition from the public, although a considerable amount of effort has been necessary to convince certain of the local authorities that our choice of new names was wise.

The choice of new exchange names is also a very much more difficult matter nowadays than it was in the old days. The reasons for the accepted practice of using the first three letters of an exchange name for signalling purposes have been explained on many occasions. The difficulties arise from the distribution of the alphabet over 9 signals and the consequent duplication of signals. You may find that there is absolutely no local name that is acceptable for a particular exchange. With your true British zeal you resolve to commemorate the Bard of Avon only to find that the SHA of Shakespeare sends the same signals as RIC of Richmond, so the Bard has to be left out of the telephone world. Persistent effort is, however, gradually finding suitable names for the exchanges that are to be.

The design of automatic exchanges calls for very much more study of the individual subscriber's requirements than is the case with manual exchanges. As the switching plant has been developed up to the present time it is necessary not only to segregate private branch exchange lines from ordinary subscribers' lines, but also to sub-divide the private branch exchange lines into three groups, varying according to the size of the private branch exchange. The originating traffic has also to be sub-divided, and separate channels designed for different types of traffic. Moreover, it is necessary to investigate the probable requirements at various stages of growth of every individual junction route incoming and outgoing.

Before the opening of the first automatic exchange, it is necessary to provide at practically all the manual exchanges within the automatic area equipment which will display the numbers of lines called by automatic subscribers on other exchanges. The extent of the equipment required in each case has had to be determined by the London Telephone Service, and we have had to ensure that the stage of transition from one type of equipment to another can be negotiated without impairing service efficiency.

I am afraid the whole question of automatic exchange design is far too detailed to permit of any further description on this occasion, but I should like to make some reference to the proposed Tandem Exchange, which will be a new factor in the handling of telephone traffic.

Under existing conditions exchanges are provided with two types of direct junctions to other exchanges. One type is controlled by order wires (in which case the receiving or "B" telephonist determines which junction shall be used for any call) while on the other type the answering telephonist herself selects the junction on which the call is to be connected, and signals the telephonist at the distant exchange. Where no direct communication exists to the objective exchange required by a calling subscriber, the answering telephonist speaks to a junction centre and obtains from that centre a line

to the objective exchange. All communications over such a route are on a signal basis, which is slower than the order wire method. There are a number of junction centres in the London area, and these have to be memorised by the telephonist. The Tandem Exchange has been designed to simplify the routing of junction calls, and to secure order wire conditions for practically the whole of the traffic within the London area. Fig. 12 shows, diagrammatically, the comparison between the existing conditions and the proposed conditions. Exchanges will have no direct signalling junctions unless there is some very strong geographical justification. If there is enough traffic from one exchange to another to provide an order wire group of five junctions or more, the number varying in some measure with the average holding time per call—such direct communication will be provided. All smaller volumes of traffic will be passed

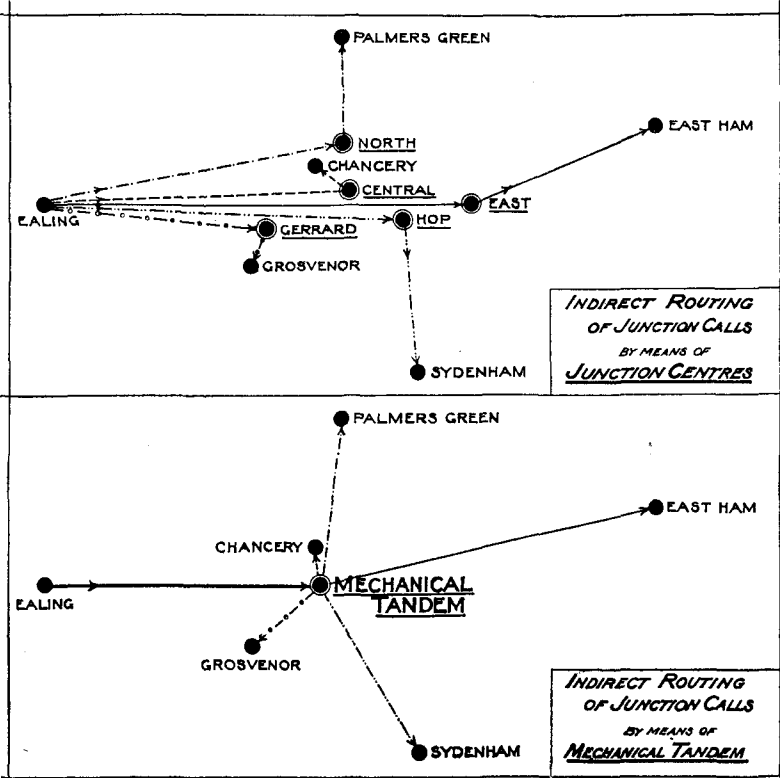


Fig. 12.

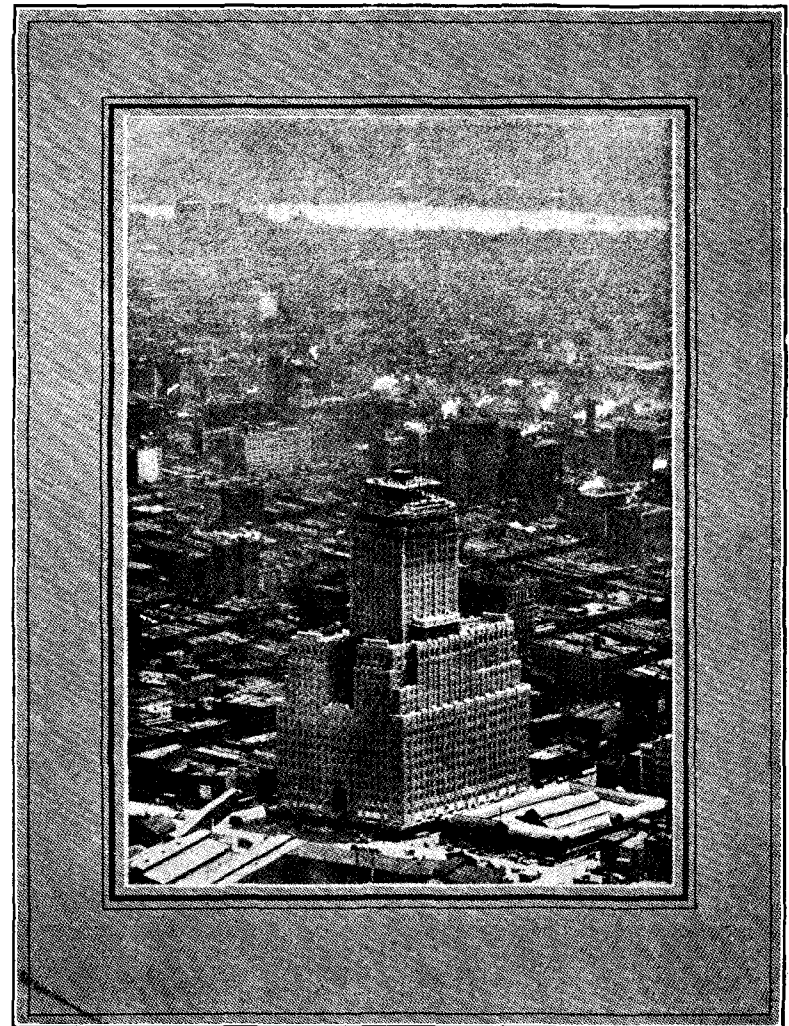


Fig. 13.

by each exchange over a common group to the Tandem Exchange, the originating telephonist passing the required exchange name as well as the number to the Tandem operator. The Tandem operator will allot the line which is to be taken by the calling exchange, and will set up the code of the required exchange, and the number of the called subscriber on keys provided on her position. The operation of these keys will cause a junction to the objective exchange to be found automatically, and the number of the required subscriber will be displayed on an indicator in front of an operator at the objective exchange.

We expect the introduction of the Tandem System will ultimately effect a considerable measure of economy in junctions in the London area, both in association with the manual system and as a junction linking point under full automatic conditions. The application of order wire conditions generally should simplify the work of the answering telephonists. In addition to these advantages it will be possible to effect a very definite improvement in the efficiency of evening and night service by concentrating very nearly the whole of the junction working on to the Tandem exchange and its associated order wires.

In facing the coming of automatic telephony in London we have all got to realise the magnitude of the task. Although the policy has been determined for some time, and exchanges are actually being built, the minds of the employees in the telephone field have not yet appreciated the problems which have to be tackled, and the alterations in their point of view which have to be effected. An extensive educational campaign is essential. It is being

carried out on the engineering side, and it has to be applied equally to the traffic and commercial sides. We have to be prepared for all the differences which will take place in methods of traffic distribution and the observation of service efficiency. Operating values and suitable loads have to be determined on a more or less empirical basis, and confirmed or modified by actual experience. The public has to be educated and we have to see that the automatic policy is not handicapped in its early stages by misunderstandings on the part of subscribers or service defects arising from mechanical or human causes.

Apart, however, from the general task of education throughout all ranks, the main objective has to be secured by more efficient co-ordination of all the activities of the department. We have still a lot to learn in the matter of building up throughout the administrative, engineering, traffic, and commercial branches a common view and a common aim. We have got to understand one another better. We have got to set up short cuts to that magic condition "achievement." This is not the place for me to suggest how this could be done; but in this connexion I propose to draw attention to what may perhaps be regarded as an object lesson to us all in achievement.

In 1923 the New York Telephone Company decided that they would centralise all their administrative activities in one building which would be provided in the congested down-town area of New York. The site for the building was acquired during 1923. If I remember rightly it was approximately 240 ft. square, and was covered with existing buildings. The clearance of the space was proceeded with immediately, and the foundations had to go down 70 feet.

A picture which appeared in the *Telephone Review* early in 1924 showed the conditions after the excavation of the site. The last rivet of the iron work of the structure was driven by the president of the company personally in June of this year—Two years after the acquisition of the site!

Fig. 13 shows a view of the building taken from the air. This view appeared in the last number of the *Telephone Review*.

I think you will agree with me that we can regard the progress in this matter as an achievement. That achievement results from a very clear conception on the part of the higher officers of the organisation of what their objective is, from their ability to go ahead with the material development of their ideas, and from the closest co-operation and full knowledge of the objective on the part of all the responsible officers of the organisation. The possibilities of achieving that condition are to my mind a subject for further serious study in this country.

I am conscious that my remarks this evening have been of a somewhat rambling character, but I hope they have been effective in demonstrating the magnitude of the traffic and staff problems which have to be handled in giving London telephone service. I had hoped to have demonstrated more fully the value of some of the detailed statistical evidence of what has been and what is being done, but time does not permit. We have standards for practically every item of this most detailed business. The business is, however, growing at such a rate and the conditions are modified to such an extent from time to time, that we cannot afford to rest on our oars, and base everything on precedents. We have to make new precedents almost every month and certainly every year, and in the wise administration of such a service common sense must always take a most important part. We must not allow ourselves to be the slaves of standards of value which in some respects may be a little behind the times.

I have confined my paper almost entirely to matters which are the immediate concern of the Department for which our Chairman for this Session (Mr. Valentine) is responsible. I should, however, like to make it clear that we appreciate to the full the work that is being done on the engineering side, and the spirit of ready co-operation shown by our engineering colleagues.

In conclusion I would like to acknowledge my indebtedness to Mr. Edmonds as the originator of many of the graphic statistics shown to you this evening, and to those members of the I.T.S. Traffic Branch who have rendered willing and able assistance in the preparation of my illustrations.

TELEGRAPHIC MEMORABILIA.

STRANGE as it may seem to those unacquainted with the hugeness of the C.T.O., London, it is nevertheless true that the news of the death of our much respected colleague Mr. W. T. Cousins, Asst. Supt. of the Inland Telegraphs, did not reach the writer till so late in October as to miss our last month's issue. Mr. Cousins was occasionally a contributor to our columns, and was one of the pioneers of Baudot multiplex. The C.T.O. has been particularly fortunate in its staff that there has always been a competent body of enthusiasts ready to give of their best whenever the need presented itself. It was so with the introduction of high-speed multiplex printing telegraphy of which W. T. C. was perhaps its finest exponent. Of him it was well said by one of his most

intimate colleagues:—"He quickly grasped its details and intricacies and his experience was embodied in most comprehensive notes. These formed the basis of lectures when he became one of those chosen to introduce Baudot working into provincial offices. Painstaking, even super-conscientious in every section of his work the development of multiplex owes much to our lamented colleague."

It was a fitting and gracious tribute to the fine qualities of the deceased that among those who stood at the Southend graveside was a representative of the Traffic Section, Secretary's Offices, in the well-known person of Mr. H.W. Pendry.

Those who have attended the late International Telegraph Conference in Paris, which lasted some eight or nine weeks, are unanimous in attesting to the strain of so long-drawn out a gathering.

It would at first seem scarcely fitting, in these columns, to mention any name especially one from among the Managing Committee of the *T. & T. Journal* for special eulogy, were it not for the unanimous and at the same time unselfish and generous encomium of Mr. John Lee's fellow delegates from this country. The Conference was one of the most important ever held, and with the heavy arrears of work due to its repeated postponement owing to the war, presented over one thousand suggestions and amendments, handed in by telegraph administrators the world over, and representing the arrears of about fifteen years,—for the thoughtful consideration and decision of its polyglot delegates. That one of the delegates from this country should have been elected to the chairmanship of the principal Committee was therefore in itself sufficiently flattering to ourselves as Londoners, and to the Telegraph Service as Britishers. That the honour, in so doing, should fall upon the chief of the C.T.O., London, is an addition which we here in the Capital will endeavour to bear as modestly as becomes the great! There is one more item. At the close of the conference the Grand Committee acclaimed "M. le president John Lee," all standing!

There were of course many social functions, at some of which the delegates found it impossible to attend owing to the after-conference hours pressure of committee work.

At one of these functions given by la Compagnie Française des Câbles Télégraphiques in the Palais d'Orsay on Sept. 15, M. Ernest May, chairman, in the course of a very happily worded speech said:—"I am indeed honoured in my position as chairman of the Compagnie Française des Câbles Télégraphiques. I can only justify that position by reason of the years I carry, which certainly constitutes me as the *doyen* of you all. If I owe that honour merely because of this qualification, I shall be able for the first time to realise that truly old age brings some recompenses."

This fact however has permitted me to belong to that world, and to that period when the first cable was laid between France and England, to have seen the commencement of hand telegraphy, and to have followed through the many years, with passionate interest, all the remarkable progress of telegraphic communications."

Continuing, the venerable speaker, with a touch of wistful prophesy and a tang of delightful humour, went on:—"After all that I have seen in my lifetime, I am this evening in a day of dreams, and I ask myself if in the distant future men will not be able to communicate with one other by the simple effort of their will-power, without wires, without cables, maybe without waves!

Of course, gentlemen, you quite understand that I do not wish for such progress, a state of affairs which would neither be to the taste of our shareholders nor to that of the governments who levy upon communications every dime worth having."

At another banquet, on this occasion given by the Telegraph Cable Company, Sir John Denison Pender gave voice to the developments in the manufacture of telegraph cables, in the increase of speed of the modern submarine cables as well as the vastly improved methods of laying such cables on the ocean bed.

At the wireless station of Saint-Assise too, M. Girardeau, representative of la Compagnie Generale de T.S.F., at a dinner given by the French wireless companies on Sept. 23, spoke on behalf of this the youngest child of telegraphy—wireless—in a speech of beautiful courtesy, poetry, and historic reference which surely the environment of the district must have inspired.

Senateur Marconi at another of these functions also added his quota to the Wireless side of telegraphy and very moderately and very modestly emphasised certain advantages of wireless which, "*meme nos amis des compagnies des cables*" recognise, only a wireless system is able to give.

Of the remaining representative speeches, that of the Chairman of the British delegation who represented not only a government telegraph department but a government telegraph department which with steady aim and purpose was building up a combined telegraph system of Anglo-European cables and wireless communications, will be more than usually interesting. *Le Journal Télégraphique* reporting thereon says, M. John Lee, President de la Delegation Britannique, replied to the speech of the Minister of Commerce, Industry, Posts and Telegraphs on Oct. 21 at the Palais de la Sorbonne in the following few but most appropriate words:—"Monsieur le Ministre, The close of a conference is a tragic moment. Such moments present the elements of tragedy, even when those who like ourselves find themselves in the midst of a memorable banquet. I have read in your journal *L'Illustration* a leading article in which it is said that the Nineteenth Century has laboured to destroy old institutions. As regards ourselves we have given two months of our life to the reconstruction of the World's telegraphy. But, besides the

satisfaction of duty accomplished, we have had as our reward your fine city, with its environs, its history, its charm, and above all your friendship, your cordiality and your hospitality.

"Monsieur le Ministre, we regard your presence in our midst as the crowning of our work, our pleasure and our souvenir of an unforgettable collaboration. They say we English are cold, but with the other delegates we are sensitive and with warm hearts keenly appreciate the obligations which we are under to yourself, to our brothers of the Reception Committee and to the French delegation."

The Japanese delegates were defeated in a resolution which should be specially mentioned so tactfully, logically and unbiassedly was it placed before the Conference. It should be said that under the present Convention French is looked upon as the International language, and for conference purposes all business is conducted in that tongue. The Japanese wished to add a second and that one to be English as being a *lingua franca* in most ports and business centres of the world. The difficulty of obtaining agreement was soon evidenced, the Germans wanted to make a third language, the Spanish and the Italians then put in a plea, and the humour of the situation was brought to a climax by a claim for Erse by the I.F.S.!

An interesting London function was the Special Sections Complimentary Concert and National Presentation to Messrs. Sutton, Rudderham, Badderley, Jordan and Chris Thompson at the Cannon Street Hotel, on Oct. 26 last.

The nature and *raison d'être* of this concert is legal history now, but it seems only fit that the fact of its having taken place should be recorded in these pages. No detailed enumeration of the items is necessary; no names of the artistes need be mentioned; no verbatim account of the speeches will be attempted, for there foregathered a right gallant brotherhood of grateful warriors, and there were sounds of merriment by night!

Sir William Slingo, Engineer-in-Chief of the General Post Office from 1912 to 1919, has been appointed a director of Marconi's Wireless Telegraph Company, Ltd., in the place of one of the two directors who have just retired from the Board of that company. The two gentlemen who have just resigned are Sir Charles J. Stewart and Mr. H. Morgan.

Sir Frederick J. Barthorpe, formerly one of the managers of the Westminster Bank and an alderman of the City of London, has filled the second vacancy.

The sad event of Mr. Tucker's death after the briefest of illnesses and the peculiarly tragic circumstances which attended that event, came as a real blow to the many Cable Room friends of this much respected ex-member of the C.T.O. Foreign Telegraphs. To his bereaved wife, who was also "one of ours," we tender our united and affectionate sympathy.

We are also sorry to hear that Sergeant E. C. Arnold, formerly of the North Walsham Repeater Office and now stationed at Nevin, is still suffering badly from the after effects of his war-service in France.

Commander Loring's lecture on the work of the Ship-to-Shore Wireless Department of the Post Office was a real success, and it is to be hoped that the information given by this worthy officer will be read by a much wider public even than that which the Post Office could itself provide.

The lecturer spiced his chatty discourse with just that measure of humorous anecdote that lightened the serious nature of the subject to that fine degree which betokens the skilful platform speaker. The audience followed with an interesting debate in which the Board of Trade, Lloyd's, Marconi, and the B.B.C. were well-represented, the Post Office largely making way for the visitors.

Captain Loring made a spirited appeal, in his reply to the questions and criticisms of those who complained of the stoppages and interference caused to broadcasting by the use of certain wave lengths on the ground of the safety of human life at sea which nowadays depended more than ever upon the effective use of wireless telegraphy.

Just because, so it would seem—we in the C.T.O. are in the throes of the most complex structural alterations conceivable, the extensive nature of which would never be guessed by any scrutiny, however close, of the exterior of the edifice, we appear to have had an unusual number of distinguished visitors this summer and autumn. It must naturally detract somewhat from the impression of the telegraphic portion of such visits to have one's attention as a visitor diverted by intruding temporary balks of timber, iron stanchions, darkened and obstructed gangways, and at times a lime-impregnated atmosphere.

Nevertheless it is gratifying to know that despite these drawbacks there have been those who with a practical knowledge of our craft have been able to realise something of the difficulties of "carrying on" under such conditions. One such from "down under" quite recently paid a wonderful tribute to the "wonderful organisation, the lack of fuss and pother, the smoothness with which each operation was performed, the excellent co-operation between the different grades of the staff as telegrams were handled from point to point, as well as the co-operation between individuals of the same grade when dealing with public traffic." Continuing he said:—"If you do your work and the place moves so easily with all this mess and inconvenience round, then I should like to see you once again and that when your re-building is over and done

with. I have seen many large telegraph offices in the world, never one so large as the C.T.O., London, certainly never one where the wheels moved so easily, and so quietly."

One of our schoolboys, with some aspiration to a position in the Telegraph and Postal Service of this country gave the following definition in all the innocence of his debutant stage:—"Evolution is what Darwin did; revolution is a form of government abroad; devolution is something to do with Satan!"

ATLANTIC OCEAN.—The Atlantic Ocean as all recent maritime records show has been particularly boisterous lately, and being no respecter of persons, the cable ships whose duties call them across the "pond" have had their share of trouble. Thus the *Lord Kelvin*, owned by an American Cable company, sent out a S.O.S. message on Nov. 6, but under her own steam and by running before the gale, managed to reach Queenstown Harbour four days later. That her captain had every cause for sending out the distress signal in the first place may be gathered from the following account given in the *Daily Telegraph* the day after her arrival. The *Lord Kelvin* is only a vessel of 2,640 tons, and was built at Newcastle-on-Tyne in 1916 by Swan, Hunter & Co.

With her decks a scene of utter chaos and her afterholds filled with water, the cable ship *Lord Kelvin* entered Queenstown Harbour yesterday after a severe ordeal in mid-Atlantic during a terrible south-westerly gale last Friday. One of the officers said that when most of the crew were asleep a huge wave struck the vessel broadside and carried everything in its path overboard. They thought the ship was about to sink.

"Before that," continued the officer, "we had picked up signals of distress from six other vessels the same night. All the boats had been smashed or washed overboard. The engine-room telegraphs and other deck fittings were torn off and carried away, the forward bridge superstructure was washed away, the tops of the tank hatches were stove in, the holds were flooded, and the saloon was badly buckled. In addition all the lights had been put out of action owing to the inrush of water in the engine-room damaging the electric dynamos. During the darkness we almost collided with two ships that were coming to our aid in response to our S.O.S. They could not see us, as we were showing no lights, and only by lighting flares could we make our presence known. We managed to get the ship around and run before the gale.

"During the height of the storm several large buoys, weighing about a ton each, became loosened on the foredeck, and to prevent the ship from being holed it was imperative that they should be secured immediately. Mr. Foote, the chief officer, with a number of men, volunteered to secure them, a dangerous task, which was accomplished. Mr. Foote, however, was caught by a big wave, and was going over the side when a huge Newfoundland member of the crew grabbed him by his clothes and pulled him back again. He then continued his work as if nothing had happened. Several of the crew received injuries to the face and hands during the gale, but none was seriously injured." Orders for the engine-room from the captain or officers on the bridge had to be conveyed by relays of men transmitting the verbal instructions from one to the other. Fortunately the steering gear remained intact, and the vessel was able to steam unaided.

CANADA.—Reuter's Ottawa correspondent informs us that the Radio-Telegraph Branch of the Department of Fisheries announces the opening of a directional wireless station on Belle Isle, at the northern entrance to the Gulf of St. Lawrence. The new station will operate continuously on a wavelength of 800 metres, with the call letters "VCM." Belle Isle is the first landfall for transatlantic vessels traversing the northern route. The station will be equipped with its own generating plant.

EGYPT.—It is reported that a Union has been formed of Greek enthusiasts with the object, amongst others, of establishing a low-power radio-telephone broadcasting station at Alexandria. Government permission will have to be obtained before the installation can be carried out.

GERMANY.—The London *Times* states that a considerable reduction in the number of German broadcasting subscribers is announced, and the Post Office officials whose duty it is to collect the fees are urged to greater efforts, the official view being that the decrease is more probably due to "licence-fatigue" than to lack of interest in the broadcast programmes. Severer measures against the owners of unlicensed receiving sets are also hinted at. Proceedings against "black-hearers," as they are called in Germany, have always been a feature of German broadcasting, and periodic announcements are made of convictions, the appeals to the dilatory usually ending with a reminder of the smallness of the fee. It is at present 24 marks (£1 4s.) per annum.

"Licence-fatigue" is a rather more polite term than is usually applied to defaulters!

HUNGARY.—From Budapest via Reuter it is reported that Mr. Jeremiah Smith, League of Nations Commissioner-General for Hungary, has given his consent to the construction of the Hungarian section of the long-distance telephone cable between Budapest and Vienna which the Austrian and Hungarian Governments recently agreed to lay down. The cable will contain 96 wires, as compared with the seven overhead telephone wires at present available, and will give Hungary direct telephone communication with the Western countries of Europe. The work is to be completed by the middle of 1927. The Government has also entered into communication with the Czecho-Slovakian and Yugo-Slav Governments with a view to getting Prague

connected up with this great trunk line by a branch through Pressburg (Bratislava) and Belgrade by a branch to be extended eventually to Constantinople. It is not known whether telegraph circuits will be worked in these same cables.

IRISH FREE STATE.—The first radio broadcasting station in the Free State it is hoped will be in operation within the next few weeks, if not earlier. A second station will be built later at Cork, the main function of which will be the relaying on low-power of the Dublin programmes, although there will be a small studio at Cork also; a landline is being laid between the two stations. The service will be controlled by the Post Office and financed by licence fees; For the last three years owners of receiving sets in the Irish Free State have paid one guinea a year for the privilege of hearing Belfast and other B.B.C. stations. About £10,000 has been collected thus each year, all of which has been absorbed by the post and telegraph department of the Free State Government.

The studio will be in Denmark Street, off Henry Street, the station itself being in the McKee Barracks. The transmitter, which will operate on a wave-length of 390 metres and will use the call sign 2 RN, is a 6-kw type Q set, the same type as the majority at the British main stations.

JAPAN.—Manufacturers of the cheaper grades of wireless apparatus in the United States and Great Britain, particularly the former, are to find the Japanese market closed to them in the near future if the plan of the Finance Department materialises. This plan is to include all wireless materials and parts under the "luxury tariff" enacted a year ago, which imposes an import duty of 100 per cent. Recently American wireless material has been imported in great quantities. There are now 70,000 subscribers in Tokio to the broadcasting service, and it is expected that this number will be doubled by the end of this year.

JUTLAND.—The Jutland Telephone Co. has accepted Hambros Bank's offer of a loan of £20,000 sterling at 5½ per cent., guaranteed by the Danish State.

LATVIA.—*Commerce Reports* says that the construction of the two towers for the radio broadcasting station at Riga has been completed, and it is expected that the station will be in operation shortly. The Latvian postal administration will not apparently now monopolise the future radio business in Latvia as originally planned, it is understood.

LONDON.—The latest figures issued by the Post Office show that at the end of October 1,509,520 broadcast licences had been issued. This figure shows an increase of 45,128 over the figure for the end of September, which was 1,464,674. At the end of October, 1924, the number was 997,673.

According to the *Evening News*, during the last six months 30 underground cables have been completed and brought into use. They extend, altogether, for more than 470 miles, and contain 70,400 miles of wire. In addition, the new main cable between London and Glasgow, 440 miles, has been laid. During the last financial year more than 1,000 miles of main cables were drawn into underground conduits. There are now in this country 4,000,000 miles of post office wire underground, and 1,000,000 miles overhead.

PARIS.—The plenary meeting of the International Telegraph Conference here adopted, on Oct. 24, the increases in telegraph charges recommended by its Tariffs Committee. While the maximum terminal and transit rates chargeable are thus increased to keep pace with the increased working costs, no country is obliged to raise its rates; in practice, rates generally will not be raised except probably in the case of Germany, whose State telegraph systems are working at a loss. Great Britain has come to an arrangement with all European countries that there shall be no increase in the rates to and from Great Britain, except in traffic with France and Germany, and in the case of these countries it is not certain that the increases will fall entirely on the public. The foregoing only refers to Intra-European traffic. As regards extra-European traffic, a slight increase in the maximum terminal charges at the European end is authorised, but the rates payable by the public will not be increased, the increases, if imposed by the Governments, being absorbed by the cable companies. The Intra-European increases will come into force on April 1, 1926.

A plenary meeting of the International Telegraph Conference on Oct. 21 also decided to make no changes at present in code language, but appointed a committee to report on the subject by next October. This means that the present rules as regards code cipher will remain in force until the next International Telegraph Conference some three years hence.

PERU.—The Government of Peru is to enforce the provisions of the wireless law calling for the inspection of all radio installations and the collection of a tax of one Peruvian pound for each receiving set in use. The general administrator of mails, telegraphs, and wireless is intrusted with the assessment and collection of this tax, together with the establishment and maintenance of a registry of all sets in use.

RUGBY.—It is understood that the radio-telephone apparatus which the Western Electric Co. has installed at the wireless station at Rugby has been completed; so far as the company is concerned, everything is now ready for transmission, and the Post Office has taken charge. According to the *Morning Post*, transmission tests to America are likely to take place shortly, if they have not already begun.

SOUTH AFRICA.—Owing to the non-payment of licence fees, the three broadcasting stations in the Union are said to be in financial straits, and the Government is being pressed to introduce legislation to make the payment of fees compulsory.

The following telegram was received by the Secretary of the P. and Telegraph Association of South Africa on August 25 last from the Minister of Posts and Telegraphs, Cape Town:—"Your Association will be pleased to hear that authority has now been obtained for an increase of fifty First Class posts. Northern and Southern Promotion Committees to now sit jointly in Cape Town and consider recommendations for promotion. In order to secure confidence of staff as to impartial selection am arranging for you to be present at sittings of Joint Committees."

The news does not appear to have been published before in this country, and although the actual date of this unique communication is so far back it still appears to be sufficiently interesting to place on record. The Secretary, Mr. J. H. Whitaker, was subsequently present at the meetings of the Selection Committee, as an observer only, and of course without responsibility as regards the result of the actual selections, and reported that the recommendations, "represented a genuine and unbiased attempt to find the best men in accordance with the reference."

SPAIN.—On Nov. 1, a wireless fog signal installed at Cape Silleiro, on the Galician coast came into operation. The letters O R will be broadcast on a musical note of 800 vibrations per second during 30 seconds every five minutes. The wave-length used will be 1,000 metres, and an ordinary ship's wireless receiver will be able to pick it up at 30 miles distance. This is the first signal of its kind upon the Spanish coast.

SWITZERLAND.—With the object of enabling manufacturers and importers of radio sets and components to offer their goods for sale in Switzerland with a Swiss certificate of merit, the Jean Noelting Wireless Testing Laboratory has recently been established at Meilen, Switzerland, under the patronage of the Swiss Radio Club.

UNITED STATES.—*The Electrical Review* and *The Times* are responsible for the following:—A demonstration of the simultaneous transmission of eight or more wireless messages from one transmitting valve on the same ten-metre wave-length, and their reception on a single instrument, was made some weeks ago by the inventor, Mr. J. H. Hammond, jun., before officials of the Navy Department, who have now permitted the announcement of a detailed account of this system of "selective secret radio transmission." Prime importance is attached to the utilisation of short wave-lengths in view of the fact that virtually all the available wave-lengths have already been allotted to broadcasting stations. It is explained that the general principle of the system is the projection of a short carrier wave at the rate of, say, 30,000,000 vibrations per second, on to which are impressed one or more modulatory waves at the rate of 27,000 vibrations per second and upwards, which produce periodic changes of intensity in the carrier wave. The Hammond receiver is designed to separate the frequencies of the complex incoming wave, having one circuit sensitive to the carrier wave, and the other circuits sensitive to the frequencies of the modulatory waves. Only an operator knowing the frequencies which are being used can pick out incoming messages.

Not least in point of interest of the U.S.A. news is the advance made by the American Government in taking over the radio service for the use of the Army and Navy and other government departments, thereby effecting considerable economies and adding to the efficiency of telephone communication. In support of this statement we learn from the *T. and T. Age* that the maze of wires formerly used by the Government has been supplanted by a network of radio stations manned by Army and Navy personnel and transmitting messages not only to the two military arms, but to other Government departments as well. About two million words in Government messages are radiated monthly from Washington, through Army and Navy stations. Until recently about half of the Government's messages were dispatched over commercial lines, and the Government radio has not only expedited and effected economy in communication, but its wide use has served to train a large force and erect a system that could be highly valuable in the event of war. The Navy sends and receives an average of more than one million words by radio, its own leased land wires, and through commercial companies.

Of this, little more than one-fifth is now transmitted by private concerns, with radio handling the larger part. Development during the past year of short-wave sending has considerably increased the Navy's capacity for handling messages, and when the battle fleet was in the Antipodes recently two-way short-wave communication was readily established with Washington. The War Department has established a network of 60 radio stations, and it undertook its first great expansion of the use of radio for departmental business at the beginning of the fiscal year 1923 and transmitted through its stations that year less than 4,000,000 words. In the fiscal year 1925, ending last July, nearly 8,500,000 words were transmitted.

Atomic energy.—Shall we ever be able to tap this energy? I am of opinion that atom energy will supply our future need. A thousand years may pass before we can harness the atom,—or,—to-morrow might see us with the reins in our hands. That is the peculiarity of physics, research and accidental discovery go hand in hand.—*Sir William Bragg.*

PROGRESS OF THE TELEPHONE SYSTEMS.

THE number of telephone stations working at the end of Sept., 1925, was 1,327,038. New stations numbered 15,951, and cessations 6,435, resulting in a net increase of 9,516 over the Aug. total.

The growth for the month of September is summarised as follows :

Telephone Stations—	London.	Provinces.
Total at Sept. 30	464,979	862,059
Net increase per month	2,972	6,544
Residence Rate Installation—		
Total	88,859	150,480
Net increase	1,051	1,956
Exchanges—		
Total	107	3,802
Net increase	—	24
Call Office Stations—		
Total	4,350	15,262
Net increase	24	125
Kiosks—		
Total	157	1,331
Net increase	4	79
New Exchanges opened under Rural Development Scheme of 1922—		
Total	—	779
Net increase	—	22
Rural Party Line Stations—		
Total	—	9,735
Net increase	—	74
Rural Railway Stations connected with Exchange System—		
Total	—	651
Net increase	—	11

During the month of July (the latest month for which figures are available) the inland trunk traffic was particularly heavy, and exceeded all previous records. The number of calls dealt with was 7,780,949, an increase of 930,227 over the July, 1924, total.

The number of calls made to the Continent during July, 1925, was 18,637, and from the Continent 22,770.

Further progress was made during the month of October with the development of the local exchange system. New exchanges opened included the following :—

PROVINCES—Torquay, St. Mary Church, automatic.

and among the more important exchanges extended were :—

LONDON—Franklin, Sydenham, Wanstead.

PROVINCES—Bramhall (Manchester), Blyth (Northumberland), Bognor, Cheltenham, Cradley Heath, Dudley (manual board), Kendal, Mumbles, Ramsgate, Swindon, Stockport, Sheffield (West), Tettenhall.

During the month the following additions to the main underground system were completed and brought into use :—

London—Sevenoaks—Tunbridge Wells.

Northampton—Rugby.

while 62 new overhead trunk circuits were completed, and 67 additional circuits were provided by means of spare wires in underground cables.

DEATH OF THE FIRST BRITISH LADY TELEPHONE OPERATOR.

ALL members of the staffs of the old telephone companies will have heard with great regret of the death of Mrs. R. Heywood Claxton, the wife of the late North Western Provincial Superintendent at Liverpool under the National Telephone Company's regime.

As our readers are probably aware, telephone operating was originally performed by boys, and indeed it was not until well in the 'eighties that the operating of the London exchanges was entirely undertaken by women. Liverpool, however, preceded London in making the change, and the pioneer work in this direction was carried out by Mrs. Claxton, who studied operating and trained the first lady operator (Miss Ling) at Liverpool when a female staff was established there. Mrs. Claxton then kindly undertook the training of the first staff of female operators in London. She first trained Mrs. Merlin (who became Lady Superintendent in London) at Liverpool and then came to London to start the newly trained staff, with the most successful results. Her work was entirely a labour of love, and she will always be most affectionately remembered by all with whom she came in contact.



Mrs. Claxton, who married in 1866, was the daughter of Mr. Thomas Johnson, J.P., of Lichfield. She was an exceptionally clever woman and was a most valuable helpmate to her husband, taking the greatest interest in all telephone work. The writer well remembers going on one occasion to Mr. Claxton's house to discuss some telephone problem of the time, when he found that Mrs. Claxton was thoroughly able to argue the case and was most helpful. All old Telephone men will feel the loss of another deeply respected Telephone Pioneer.

C. B. C.

REVIEWS.

“Transmission Circuits for Telephone Communication: Methods of Analysis and Design.” By K. S. Johnson, Member of the Technical Staff, Bell Telephone Laboratories. (London: The Library Press, Ltd. —Price 21s.)

This book is a welcome addition to the literature on the subject of telephone transmission. It covers the general theory and principles of design of telephone lines and apparatus. Commencing with a short summary of the fundamental facts about the voice, ear, transmitter, and receiver the author proceeds to the simple circuit, consisting of a transmitter, receiver, and connecting line only, and thence by steps to the more complete subscribers circuits. He deals very thoroughly with the subject of equivalent T networks, the transmission characteristics of telephone lines, wave filters and corrective networks or equalisers. The subject of wave filters and equalisers is an important one in connection with the operation of telephone repeaters, carrier current and voice frequency telegraphs, etc. Some of the terms used will be strange to English readers, but they are all clearly defined, and a knowledge of their meaning is necessary when reading up-to-date articles on the subjects treated in this book.

The book can be thoroughly recommended.

J. E. S.

TELEPHONE NOTES.

The Weather Forecast.

So there are at least two constants in that most variable of variables, English weather. We can always rely every year, it appears, on the second week in November being frosty, and we can always expect a storm at Christmastide. Which reminds one that there is yet another forecast which can be accepted with but slight reserve, a severe snowstorm every ten years. The *P.O.E.E.J.* of July, 1916, contained the following from the pen of Mr. T. Plummer: "My thoughts turned back (during the snowstorm in the March of that year) to a piece of evidence given so long ago as 1885, by the late Mr. Edward Graves, Engineer-in-Chief to the General Post Office, before the "Select Committee on Telephone and Telegraph Wires," in answer to a question put to him by a Mr. Coleridge Kennard, M.P. The honourable member said:—"You spoke about the snowstorm (being the ultimate) test, and of being unable to come to any conclusion, there being a severe snowstorm perhaps but once in ten years; did it ever occur to you to apply American experience to the question of your wires in that regard?" Mr. Graves' reply was—"I think we know pretty well what has occurred in America. There has been one snowstorm which has been very destructive; but still the conditions of our climate are not the conditions of the American climate. Our own experience is: Seeing that once in ten years telegraphs are seriously affected by snow, as in 1866 and 1876, I look therefore, with some dread to the year 1886." Remarking on this, Mr. Plummer went on to say: "Sure enough the 1886 snowstorm duly came. . . . Again in 1896 there was a big breakdown, and a lesser one in 1906. There can be no doubt about the 1916 snowstorm, and. . ." Well, we have just had a frosty second week of November, we are approaching Christmastide and are on the threshold of a year ending in "6."

"Two famous French scientists, General Ferrie and Mons. Bureau," says *Telegraph and Telephone Age*, "recently arrived at the conclusion 'from observations collected and analyzed' that there is 'a close relation between atmospheric disturbance and the presence of currents of cold air above the mountain region of the Alps.' This conclusion fits in with the observations of our own Wireless Research Section which, as Major Lee recently said, has found that 'a large bulk of the atmospherics in this country arrive from a direction between South and East.' Unfortunately, there is little enough ground for believing with our contemporary, that the discovery of this novel theory of the cause of atmospherics 'seems certain to play an important part in the world-wide study of this never-ending problem of wireless.' For just as we know now the cause of atmospherics, so have we long known the cause of rain storms without being able in any way to influence their coming and going. Given the wireless umbrella, the wave aerial, the direction of the atmospheric storm doesn't matter unless we want to work up into it. To quote again from Major Lee's paper, "The number of patents taken out for anti-atmospheric devices is legion. Thousands of inventors have been at work in all countries, and the net result has been practically nil." It is probably to the perfection of a unidirectional radio system that we must look for a solution rather than to balanced crystals, rejector circuits, super-selectivity and the like.

A Radio Monopoly Suit.

"The Federal Trade Commission on Oct. 20 began to take testimony in the most extensive action it has ever undertaken, when hearings on its complaint against the Radio Corporation of America and associated companies in the radio field were opened at 45 Broadway, New York City," says *Telephony*. The companies cited "are charged with conspiring to create a monopoly of the radio industry . . . and combining and conspiring to restrain competition." A long list of counsel who have been briefed by the respondents is quoted, and one of these protested against the "unfairness of the proceedings. "The acts complained of," he said, "at most constitute a purely voluntary combination of supplementary and non-competitive units, for the purpose of creating an industry which could not otherwise have been created." One of the respondent companies is stated to be the United Fruit Company, and it is more than probable that this company and, say, the Radio Corporation of America, are, as learned counsel claimed, non-competitive units. Also when one comes to think of it, a great song was made of a shortage of bananas in the early days of wireless in England, so that there is perhaps something in the learned counsel's claim that these companies are supplementary units. "It was estimated that the companies cited represented an aggregate capitalisation of about \$2,000,000,000." Hence, it is not surprising to learn that "the hearings in New York are expected to continue daily for several weeks to be followed by others in Pittsburgh and other cities."

Difficulties with the Automatic Telephone.

A story has recently gone the rounds of an old lady's initial difficulty with the dial. Requiring the number 3226 and not knowing how to get it she quite rightly called in the operator. "Are you there, Miss" she said. "I want subscriber number 3226, how do I get through?" On being told

she could get the required line by dialling the number, she replied "But how can I dial it when there is only one "2" on the dial?" Not less interesting, although much less understandable, and infinitely less amusing, was the difficulty revealed in a recent long letter to the *Times*. It ran "I was much interested in the review of the activities of the Post Office regarding the London telephone service, which I saw on my return to this country from a short visit abroad. Speaking as a managing director . . . I am strongly of opinion that the Post Office is not meeting the requirements of such users of the telephone as my own company, and I see a very serious danger to us and to others similarly situated, if the system of automatic telephones becomes universally extended. . . ." From what followed it was obvious that the writer was under the misapprehension that his P.B.X. would disappear with the advent of the automatic system. It is to be hoped, therefore, that he and all who read the letter would see the correspondence columns of the same journal on the following day. It would be an omniscient administration that could foresee all the real and fancied difficulties incidental to a general introduction of automatic telephones.

Telephone Development.

"Nowhere else in all the world has the Telephone industry grown as rapidly as in the United States—especially, in rural development. The farmers of England are practically without telephone connection, while in the United States there is approximately one telephone for every two farms," says Miss Luella Clancy, of Lima Ohio. "There is another thing I have had on my chest for a long time," recently wrote "Tommy" in the *Albert Lea Minn. Evening Tribune*. "It's the terrible service one gets on the rural lines. I don't mean to criticise the operators. It's the service the wires give. Just try out one of these farm lines. You will find that just as soon as you give the number, the operator will plug into the rural line. And then, my, oh! my, there issues forth a sound like a cyclone coming." Of course it was "the old, old story of poorly-constructed cheap farm lines, devoid of maintenance most of the time, and the switching company getting all the blame for 'rotten' service." *Telephony* "has touched upon this point more than once both editorially and in its news columns." Quite so! And after careful study of the question from afar one is doubtful whether either the American farmers or the switching companies are really proud of these farmers' telephones. It is certain that if they be but half as bad as they are often represented to be by the technical journals, their retention must be attributed to other reasons than that of their utility. In any case "the farmers of England" would certainly prefer to remain "practically without telephone connection" than be troubled with the telephones described by "Tommy" of Albert Lea.

Wired Wireless in Australia.

On Sept. 10 "Carrier Wave" equipment was placed in service on the long line between Melbourne and Sydney, 600 miles apart. The system has been superposed on one of the two existing physical circuits. It provides for three or more telephone conversations and 24 telegraph messages simultaneously over a single pair of wires. The three repeater stations are at Coulburn, Wagga Wagga and Wangareta. Numerous public telephone calls were put through immediately after the opening ceremony, which was performed in the presence of the Postmaster General, General Gibson.

An Appreciation.

Have you noticed the care with which the telephone girls repeat the number after a call has been "put through?" One subscriber writes: "I like the way they give the little pause between the tens and the hundreds, thus—double two (pause) one four. And they have a delightful way of calling the 'threes' They call "thrrree" with a perfectly rolled 'r.' Some of them must have charming ripples on their tongues and rosebud mouths of exquisite sweetness."—*Bournemouth Echo*.

RETIREMENT OF MR. MACFEE.

In connection with the retirement of Mr. Macfee, District Manager, Edinburgh, under the age limit, Mr. Gauntlett, in the absence of Mr. Edmond, who had carried the matter to this stage, presented Mr. Macfee with a memento of the occasion from the District Managers and many others of his old colleagues. He expressed the hope that Mr. Macfee would long be spared to enjoy his retirement and be blessed with health and strength. The presentation consisted of books chosen by the recipient among which were a complete set of the works of R. L. Stevenson.

Mr. Macfee returned thanks for the gift, and wished to convey to all his colleagues and friends his appreciation of their kindness to him on all occasions. He intends residing in Harrogate, and hopes, if any of his friends are there at any time, they will look him up.

The Telegraph and Telephone Journal.

PUBLISHED MONTHLY IN THE INTERESTS OF THE TELEGRAPH AND TELEPHONE SERVICE, UNDER THE PATRONAGE OF THE POSTMASTER-GENERAL.

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NOTICES.

As the object of the JOURNAL is the interchange of information on all subjects affecting the Telegraph and Telephone Service, the Managing Editor will be glad to consider contributions, and all communications together with photographs, diagrams, or other illustrations, should be addressed to him at the G.P.O. North, London, E.C.1. The Managing Editor will not be responsible for any manuscripts which he finds himself unable to use, but he will take the utmost care to return such manuscripts as promptly as possible. Photographs illustrating accepted articles will be returned if desired.

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TELEPHONE PUBLICITY.

THE rumour, which seems to have taken rise from some modest propaganda work confined to London, that the Post Office is making an endeavour to popularise the telephone by public lectures illustrated by a model exchange has, it would appear, excited some conflicting emotions in the bosoms of its critics in the Press. Whilst some of them consider the idea a good one, others suggest that, instead of spending the money in this form of publicity, the Post Office should content itself with quietly improving the service. What that important personage in all great newspaper staffs, the Advertising Manager, would say to such rank heterodoxy we shudder to conjecture. Imagine a modern article of commerce left to advertise itself by its excellence alone; our censor may achieve the feat but we cannot!

Nevertheless, the demonstrations in question are not so much to advertise the service as to give the subscriber a clear idea of its working, to show him what happens when a call is made and what practices to avoid, and are thus actually designed to improve the service.

The Manchester Guardian is good enough to say "As a matter of fact, the telephone service has somewhat recently been distinctly improved—real effort has been devoted to making it better and a little cheaper than it was. Perhaps the truth is that it suffers a little, like mothers-in-law, plumbers, an English summer, and one or two other inevitable institutions, from having fallen into the

category of standing jokes. Its virtues are minimised and its failings exaggerated in order to preserve the humorous character with which it has been endowed, and it seems very doubtful whether all the lectures and model exchanges in the world can now extricate it from the familiar figures of the jester's stock-in-trade. It takes generations to kill a really old joke, and the telephone joke is now well on into middle age. Nor is it quite certain that the joke is an unmitigated misfortune from the Post Office's point of view. Evidently the Post Office wants publicity for its telephones, and the standing joke is an everlasting source of it. . . . In the matter of publicity it is better to be denounced than ignored, and from that point of view the jesters as well as these proposed lecturers are working on behalf of the telephone."

We had not, we confess, hitherto looked on the longest standing of telephone jokes in this hopeful light; but we now see that we ought to be very thankful for them. As an advertisement, they are at least gratis. They throw no expense on the telephone-using or would be telephone-using public; which is what others of our newspaper critics charge this limited experiment with doing. We must assume that in the strange world of economics where such writers live and move that the vast sums spent by advertisers on commercial ventures come out of the proprietors' private fortunes; that they are a beneficent gesture to add to the instruction and gaiety of the public. But does not the cost of every half-penny spent on advertising soap, pills, costumes, tobacco or cocoa fall directly upon the consumer? It may be that the increased use of these articles tends to their cheaper and better production, and thus the public is ultimately benefited. This is too large and too recondite a subject to pursue in these columns. But we doubt not that any outlay incurred in popularising the telephone will be well repaid to the telephone user. The value of the service rises in direct ratio to the increase in the number of subscribers. It is the aim of the Post Office continuously to develop the British telephone service until it approaches transatlantic standards of density. To do this publicity must be resorted to, and effective publicity cannot be obtained without at least some modest expenditure—even with the gratuitous aid of the humorist.

HIC ET UBIQUE.

WE publish this month a further special article dealing with the work of the International Telegraph Conference. From our contributor's notes will be gathered some idea of the magnitude of the activities of the Conference, as well as of the atmosphere of international goodwill and cordiality which prevailed. Five committees were appointed to deal with special branches of the work, presided over by delegates of the chief Administrations represented, viz., the *Commission de la Convention*, President, Sir G. R. Clarke (India), Vice-President, M. Jose de Liz Ferreira (Portugal); *Commission du Règlement*, President, Mr. John Lee (Great Britain), Vice-President, M. Mehmed Fahry (Turkey); *Commission des Tarifs*, President, Herr A. Lindow (Germany), Vice-President, Signor G. Gnome (Italy); *Commission des Téléphones*,

President, M. Milon (France), Vice-President, M. F. Kol (Hungary); and *Commission de Rédaction*, President, M. A. Roosen (Belgium), Vice-President, M. Furrer (Switzerland).

We congratulate our colleague Mr. Lee on the successful part he played in the onerous work of the Conference. We hope to publish later the paper which he will read before the London Telephone & Telegraph Society, giving some sidelights on the subject. We have, so far, only touched on the telephone side, but we do not doubt Mr. Lee's paper will cover the telegraphic problems dealt with.

LAST month the Governor of Alberta conversed over the long-distance telephone with state officials in the States of Montana, Colorado and Arizona, and with Chief Justice Anglin at Ottawa, Ontario. The inauguration of this service, by which Alberta telephone subscribers will be able to converse with any point in the United States and with many points in Eastern and Western Canada and on the coast, was made possible through the co-operation of the Mountain States Telephone Company with the Alberta Government Telephones. Repeaters have been installed at Lethbridge, Calgary, and Medicine Hat, and copper circuits set up from Lethbridge to the boundary of Montana, linking up with copper circuits extended north from Shelby, Montana. This has made possible the connexion with the transcontinental system in the States.

IN a recent address to the Dublin Chamber of Commerce, Mr. J. J. Walsh, Minister for Posts and Telegraphs, sketched the work of his department since it was taken over by the Free State. There were now, according to the *Irish Times*, three trunk circuits between Dublin and Cork, two between Dublin and Limerick; one connecting Cork and Dublin, and when the traffic justified it another could be provided at once. It was expected that the first automatic exchange would be working in Dublin by the end of next year. A relief exchange was being installed in Merion Street to relieve the congestion in the Central Exchange, and to open up an area which had been closed for some time owing to shortage of plant. A new exchange would be installed in Limerick early next year, and arrangements were being made for replacing the old exchange at Cork by up-to-date equipment. In March, 1922, there were 19,101 telephone stations, and at the end of September last 10,006 stations had been added. Principally owing to the depression in trade, 7,347 stations ceased operation during the same period, leaving a net increase of 2,759 stations. The present total was 21,800 stations. There were 194 exchanges in the Saorstát in March, 1922. Since then 127 new exchanges, of which 80 had been opened since the beginning of the year, and 210 telephone call offices, had been completed. There were now 762 call offices, as compared with 552 in 1922.

WHEN the "old order changeth," it changeth seldom without laments for what is gone. As we had expected, the passing of the telephone operator, as the automatic system gradually extends, brings with it regrets for the lost human touch provided by the telephonist's voice. A more serious source of sorrow will be the inability of subscribers on automatic exchanges to find anyone to curse but himself when a wrong number is dialled. A writer in a Leeds paper pays the passing telephonist the following tribute:—

Alas, I can offer them only my thanks and a friendly farewell.

The line might buzz and howl like the atmospherics of Transatlantic wireless, but the Leeds telephone girl's voice would come through with helpful precision and briskness.

One imagined her sitting throned in state, lifted above our petty turmoils, directing the leashed forces of electricity with queenly grace and composure. Her soothing words calmed the stormy breast with Olympian dignity. We saw her not. She was a goddess in the cloud, a voice behind the veil.

No more shall we be able, when Fate is perverse, to liberate our emotions by saying, as we sometimes most unjustly did, "Miss, you've given me the wrong number. What are you doing?" The dial will stare at our confusion

with no more human qualities than a brassie damned for slicing a ball, and we shall know that we have only ourselves to blame—always a hard lesson for humanity.

Smoother of many a rough moment, helper in many worrying plights, enviable speaker of the clear word, accept a telephone user's sincere thanks.

IN another Leeds paper "An American Girl" says, on what authority we know not, that in New York every one of the thousands of telephone girls has a telephone fitted in her house free of charge, and blames this country for its backwardness because its administration does not do likewise. We can imagine what the Treasury—and the taxpayer—would say to such a proposal!

IN a shy corner of our daily paper we noticed, last month, that its Hong Kong correspondent telegraphed, as a piece of news,—what? Why, the year-old yarn that subscribers who flirt with operators will have their service discontinued at the third offence. We commented on this alleged decree in our issue of Feb. 1924!

ANOTHER old friend which has been going the rounds of the Press lately (sometimes from "A correspondent," sometimes signed by the contributor's initials) is a paragraph (originally published in an American telephone journal) about the equivalents of "Hallo!" in various countries. We learn again all about "Au loup!", "Hello, Hallo, Hullo, and Allo, Moshi-moshi and the rest. We are told that the Germans on taking down the receiver say, "Herr So-and-So." The original article had the correct formula, "Hier So-and-So," but the error is repeated in all the copies.

A FRENCH VIEW OF THE JOURNAL.

THE *Annales des Postes, Télégraphes et Téléphones*, a monthly organ published by a committee nominated by the French Minister of Posts and Telegraphs, has in its November issue a very full and appreciative review of the *Journal*. The writer reviews in detail our August issue, touching at some length on J. J. T.'s Telegraphic Memorabilia, Mr. Archibald's articles on Telegraphic Practice, Mr. Mackay's description of the organised visits of subscribers to exchanges, Mr. Gunston's article on the telephone development of large cities, Miss Roach's article on the training of operators, on the telephonists' page, the Editorial, and *Hic et Ubique*. He also makes a reference to Mr. Muirhead's article in a previous issue on extra-terrestrial communication as "pleine de saveur." Of Col. Purves' study of automatic telephony, he says it must be read in full. "There cannot be a telegraphist worthy of the name in France who still ignores the *Telegraph and Telephone Journal*. . . . I am quite convinced of the necessity for being *au courant* with the technical literature from beyond the Channel. Nations no longer live isolated; scientific collaboration is a necessary condition of progress. Whoever wishes to take the trouble can easily learn enough English to read scientific or technical works. Who would refuse to make this effort? English is a language which pays. . . . We must learn to understand the English spirit—we are allies for ever in the cause of civilisation. And you telegraphists, my brothers, read T. F. Purves!"

We can return the compliment in all sincerity. Nearly all Post Office men read French. If they wish to keep themselves abreast of continental telegraph and telephone practice they cannot do better than read the *Annales*, which not only contains articles on the subject by leading French experts, but also extremely useful translations from German and other European technical journals.

WIRELESS TELEGRAPHY AND ITS APPLICATION TO SHIP AND SHORE WORK.*

By Commander F. G. LORING, R.N., *Inspector of Wireless Telegraphy, G.P.O.*

THE first ship that was ever fitted with wireless telegraphy was Her Majesty's Ship "Defiance," and that was in 1895—the year before Marconi came to England. I will give one or two dates.

The first official report on wireless telegraphy was made in 1896, and the Naval manoeuvres of 1899 was the first occasion on which wireless was seriously used in connection with ship working. In those manoeuvres the Admiralty fitted three ships and carried out communication up to ranges of about 80 miles. As a result of those manoeuvres the Admiralty equipped 42 ships and 8 coast stations in 1907. The Marconi International Mercantile Marine was incorporated in 1900, and the first commercial ship was fitted by that Company on May 21, 1901. At the same time they opened coast stations at Crookhaven, on the South-West Coast of Ireland, Holyhead, Caister, and North Foreland.

As a result of wireless becoming a general possession the Wireless Act was passed in 1904, and the first International Convention was in 1906. As a result of the Convention it was decided by the Government that they must take a very definite hand in the development of wireless telegraphy in the country, and Bolt Head—our first Post Office station—was opened in 1908. A year later the Post Office bought out the interests of Marconi Co. and Lloyds Corporation in the coast stations of the United Kingdom. When we bought those we had a complete organisation. (See map).

Fig. 1 shows the Post Office coast stations in 1925. Of the stations in existence when the Company's system was acquired, one was at Caister, which is no longer included in the ship-to-shore organisation. There were North Foreland, the Lizard, Crookhaven, Seaforth and Malin Head. That was the original organisation. Directly we got the stations we worked them and have done so ever since.

Fig. 2 shows the development of ship fitting since the beginning, and I think it shows better than anything else the rate at which progress has been made.

This is quite an interesting table. You can see that in 1908 we had only 227 ships fitted, and 227 ships out of 416 in the world. In 1924 we had 3,096. The business got a move on about the year 1912, and, of course, as soon as the war came along, the various countries did not notify Berne of the number of ships fitted, and that is why the list does not then vary much. But you will see in 1920, when the notification went back to Berne, the immense jump, and at the present moment there are probably nearly 16,000 ships fitted.

In 1912 we had 36% of the total ships fitted, and to-day 21%—a very decent proportion, I think.

The next thing I am going to talk about is the traffic. We deal with four kinds of ordinary traffic, and I propose to tell you roughly what is inferred by these different traffics.

Dealing first with the Press broadcasting at pre-arranged times, that traffic is sent on long wave via Oxford, and it deals with Foreign Office communiques which are sent out to the world at large three times a day; the Wireless Companies' Press which is sent out to their own ships every night is copyright and amounts to 8,800 words per week. I have purposely given you round figures, but they are substantially correct.

In addition to the Press broadcast, we also broadcast private radio telegrams to ships out of coast station range to any ships that are notified in the *P.O. Guide*. There are about 950 ships of different nationalities notified, and messages are sent from the C.T.O. via Oxford at a fixed time every night. Ships, of course, cannot acknowledge these messages, and they are sent at the sender's risk, but there is quite a large amount of traffic. We hope to extend this service very much when Rugby is installed. The range of Leaflet varies very much. Messages have been received in all parts of the world—even in submarines in Hong Kong. We hope to develop the service by giving instructions to ships about their cargoes, voyages, &c. If shipowners could feel satisfied that they could send a message out broadcast from England with a really good likelihood of any ship in any part of the world receiving the message, it would obviously be of great benefit to them from a commercial point of view. We could send the message out broadcast, and they could send acknowledgments back through other ships, and we hope when Rugby, with its high-range gets going, that we shall be able to extend this organisation to every ship.

You will all remember during the war how the Germans saved a very large proportion of their mercantile marine by means of a very similar device through Nauhen. Of course they had not the range then, but it was extremely useful.

* Shorthand note of an extempore address given before the London Telephone & Telegraph Society.

FIG. 1.—Post Office Coast Stations, 1925.

Station.	System.	Working waves in metres.	Normal working range in miles.	Duties.	Traffic in paid words per week Sept. 1925 approx.
Wick ...	Spark	600	250	Traffic ...	1,450
Cullercoats ...	"	600	250	Traffic & D.F....	4,300
Flamboro' ...	"	600	150	D.F. ...	—
Grimsby ...	"	220—600	100	Traffic ...	2,200
N. Foreland ...	"	600—800	150	Traffic ...	10,000
Niton ...	"	600	150	Traffic & D.F....	5,000
Lands End ...	"	600—800	300	Traffic ...	7,800
Fishguard ...	"	600—800	150	" ...	4,200
Seaforth ...	"	600—800	150	" ...	2,300
Port Patrick ...	"	600	150	" ...	1,100
Malin Head ...	"	600	250	" ...	2,100
Valentia ...	"	600	300	" ...	9,000
Devezes (a) ...	C.W. valve.	2,100	1,500	" ...	20,000
" (b) ...	—	2,400	1,500	" ...	
Lizard ...	Spark	800	150	D.F. ...	—

NOTE.—Lizard is an Admiralty station which gives bearings to Merchant vessels on request.

The following new stations are contemplated for Traffic and D.F. purposes:—

LINNEY HEAD (S. Wales).

MABLETHORPE (Lincs.).

The latter station will replace Flamborough Head and Grimsby.

The next traffic is through Devezes, which is all sent on continuous wave, and is only sent to ships which are fitted with continuous wave apparatus, i.e. to ships which can not only receive but also acknowledge and send messages back. There are about 275 ships capable of doing this. The range of Devezes varies a great deal with circumstances. We give it as 1,500 miles in the Guide, and its practical range is from 1,000 to 2,000 miles or even more. Wireless is not an exact science as everyone knows.

I am now going to show you two graphs (Figs. 3 and 4) one showing how the continuous wave traffic has arisen from the time it was first started, and showing that there is a call for it, and if ships are given facilities for easy communication they will take advantage of it. The second will show the effect of the Devezes service since we put in a second transmitter. It was originally only an ordinary station; about a year ago we split the station up and put the receiving station at Burnham-on-Sea, near Bristol, and kept the transmitting station at Devezes. At the same time we put in a second transmitter at Devezes and a second receiver at Burnham, so that at the present moment it is a double station, and we can receive from two ships or send to two simultaneously, and, of course, it has improved the traffic conditions and helped us a good deal in our organisation.

The first graph (Fig. 3) shows the rise of traffic from December, 1920. It has now gone up to 16,000 words per week. It is a steady curve.

The second graph (Fig. 4) shows the result of putting in the second transmitter, which has accentuated that rise. We went up there to 25,000 words in a week. The traffic to all other stations is worked on the spark system—the old original organisation we took over from the Marconi Co., with one or two new stations added. The traffic is all at 6d. a word with the exception of a certain number of ships making short voyages. For these we have special rates of 3½d. a word and 5½d. a word.

FIG. 2.—Summary of Coast Stations and Ships equipped with Wireless Telegraphy, 1908-1924.

Year.	British Ships.	World Ships.	World Coast Stations.
1908 ...	227	416	92
1909 ...	286	619	136
1910 ...	397	998	219
1911 ...	583	1,482	258
1912 ...	778	1,968	312
1913 ...	1,244	3,462	483
1914 ...	1,487	4,613	583
1915 ...	1,486	4,836	616
1916 ...	1,499	5,112	650
1917 ...	1,483	5,338	687
1918 ...	1,483	5,469	697
1919 ...	1,483	5,819	727
1920 ...	3,754	12,622	977
1921 ...	3,371	13,504	1,157
1922 ...	3,220	14,255	1,125
1923 ...	3,248	14,560	1,117
1924 ...	3,333	15,245	1,241
1925 ...	3,396	—	—

The general traffic to and from the coast stations is sub-divided, generally speaking, under three heads; you have ships' service messages, general public correspondence, and special services such as meteorological services. The inward traffic from ships (i.e. from the ships to the coast stations) is quite simple to handle, but the outward is difficult to manage and

difficult to collect. The ideal we would like to strive for would be that any member of the public could walk into a Post Office and address his message simply "Name, Ship, Country," and that there would be a central bureau in every country which would undertake the distribution of messages to the ships from the proper coast stations. The real reason why we do not get much outward traffic is that most people do not know how to send a radio-telegram, and most people, if they go into an ordinary Post Office, will find difficulties over the counter. You cannot expect the counter clerk to send radio-telegrams. But we have now an open address system in this country. You can go into a Post Office and address a telegram, "Name, Ship, Wireless," and that comes to London to a central bureau and is distributed by our people through the proper coast station. We have the same arrangement with the Americans and Canadians on the North Atlantic Coasts.

The outward traffic at the present moment is in the proportion of one, to an inward traffic of three as regards all stations, but in the case of Devizes, where this open address system is particularly applicable, we get a proportion of one of outward traffic to two of inward traffic, so that matters are apparently improved by the adoption of the open address system.

As regards the Devizes station, it was opened in August, 1920. I am going to tell you a little about control of traffic at Devizes, and you must remember that it refers in a broad sense to the control of traffic in all stations. At the station it is necessary to have knowledge of the ship's position and itinerary. I may say that the ships at intervals give their positions in order to help that point. Secondly, to know whether a vessel is coming within range or going out of range, and thirdly whether she is in touch with another vessel which is already out of range and for which traffic is on hand. We do a good deal of what is called re-transmission; the wireless companies give us every assistance in passing traffic from ship to ship.

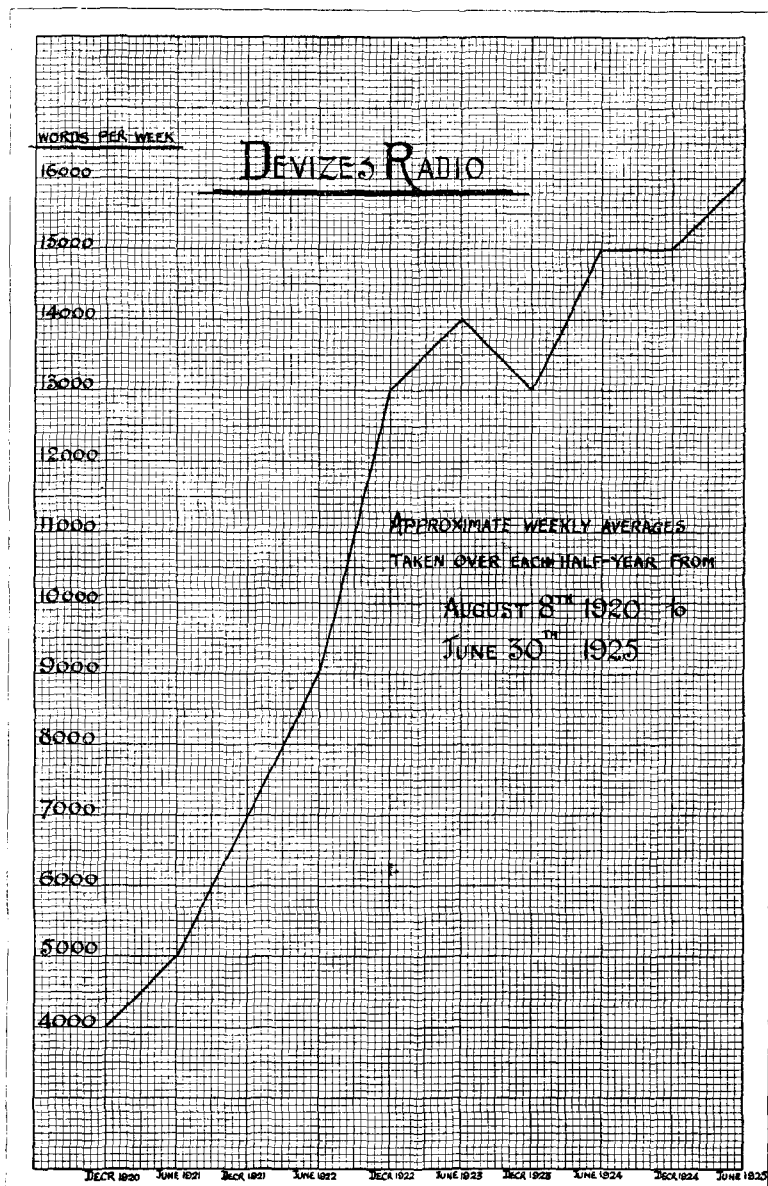


Fig. 3.

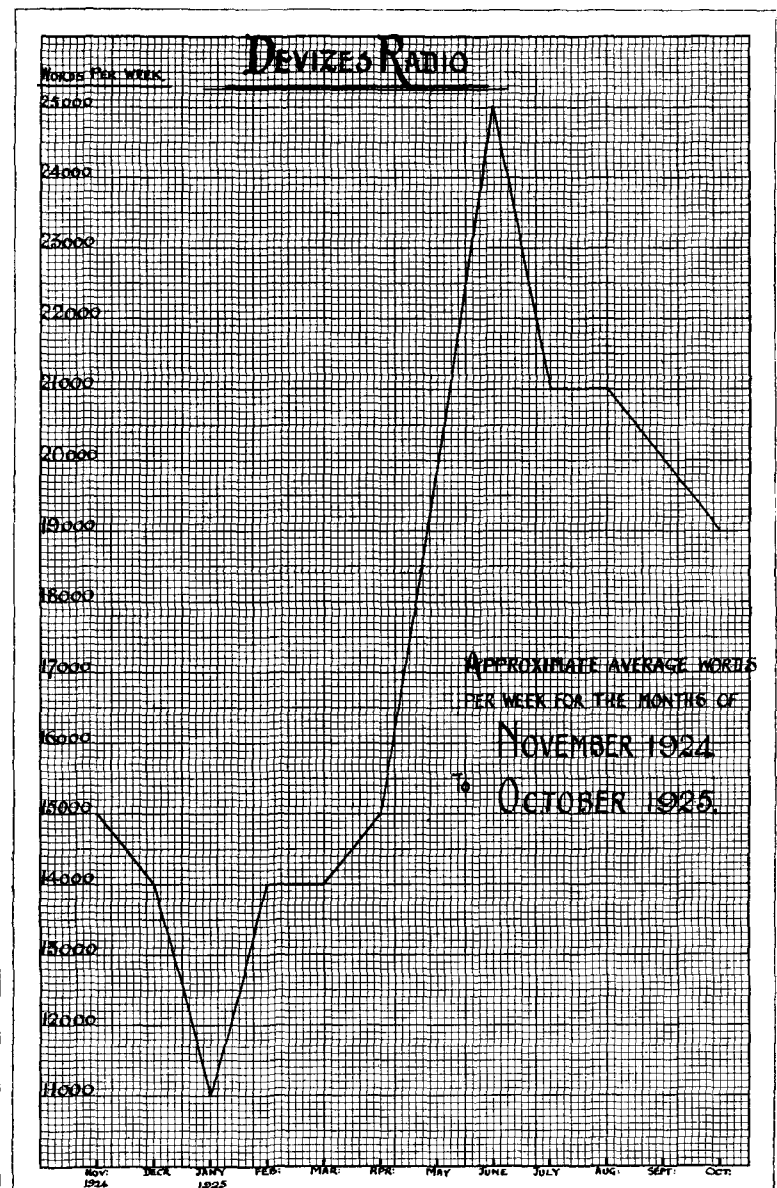
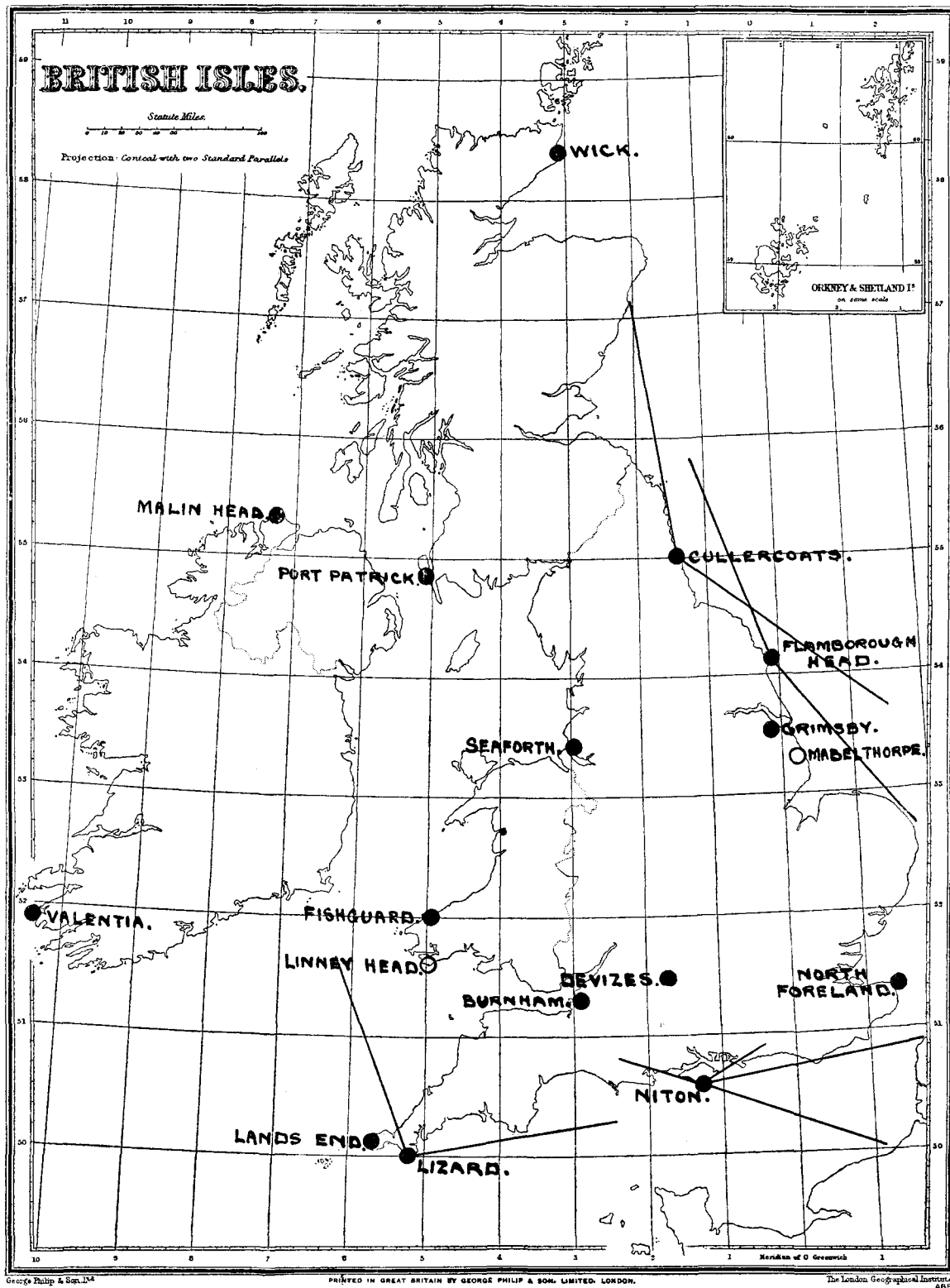


Fig. 4.

Then again, whether she is eastbound or westbound is another point operators have to mind. If eastbound in the Mediterranean we have to get the messages off as quickly as possible, because she is in touch with coast stations there or going into port. Ships on the Atlantic route are easier to get at, but the South Atlantic ships have to be watched because they get out of range with Devizes. We have at Devizes an operator whose sole duty is to look after the routing of telegrams. The station is furnished with a lot of literature—it has a daily copy of *Lloyds' Index*, a sailing list of all the big liners, and a communication chart which is published by the Marconi Co.

An operator leaving a port and going across to America notes the ships passed on the way, and these ships as they go to and fro get in touch with every other ship on their way that they are likely to come across, and, of course, this problem is very much helped by a chart like this. Devizes is also the normal medium for passing weather conditions through the Air Ministry. There is an arrangement at the Meteorological Office for ships to send in weather reports at intervals throughout the day during their voyages, and these form a proportion of the basis on which your weather forecasts are got out. Under certain conditions Devizes also assists with distress signals. Various navigation and storm warnings are sent out by the Admiralty or Air Ministry in connexion with dangers to navigation for the purpose of assisting masters of ships.

With regard to navigational warnings, this is what happens on receipt of a wireless message from a reliable source (such as a master of a ship or some other party to be trusted), regarding derelicts, temporary extinction of lights, displacement of principal aids to navigation, drifting mines or other hydrographic matter. An advice by telegraph is immediately sent to the Hydrographer of the Navy, who issues instructions as he may consider necessary over a period specified by him. That is a very valuable service



MAP OF SHIP AND SHORE SYSTEM.

to ships. The principle is to broadcast every six hours, and the transmissions are preceded by the danger signal (T.T.T.) which demands silence, and tells all ships that a signal is about to be transmitted of serious interest to navigation.

The next thing is gale warnings, which are also preceded by this danger signal; they are issued by the Air Ministry when the wind is expected to exceed 40 miles per hour. The warnings are sent out in such a way that they are pretty certain to get to a ship during the periods which are set apart by the Convention for a special watch.

Thirdly, overdue aircraft or aircraft casualties. Information is broadcast immediately on receipt, and afterwards for a period of one hour. In practice we have frequently had to send out these messages in connexion with aeroplanes or aircraft which have got into difficulties overseas.

Weather bulletins are broadcast at fixed times.

The first part is a data message in figure code showing the tendency of the barometer, direction and force of wind and visibility of observing stations situated at various points of the British Isles. In addition, any ship in touch with the coast station can send a message asking for a weather report from practically any part of the United Kingdom, either from the Meteorological Office or from Lloyds observing stations scattered round the coast.

Finally, there is a medical advice. Under Board of Trade rules, owners are bound to provide medical assistance, and if a man gets sick on board ship and his master does not know what to do, he can send a message and ask for medical advice at a coast station. The station rings up the nearest doctor and explains the case and the doctor gives his treatment. It has proved useful, and the doctors are most obliging in assisting us.

(To be continued).

NOTES ON TELEGRAPH PRACTICE.

BY G. T. ARCHIBALD.

*(Continued from page 42.)**XI.—Concerning Telegraph Apparatus used by the Post Office—Past and Present.*

The rapid development of telegraph traffic in London called for special consideration. As telephone development was slow, local telegram traffic grew rapidly, and retransmissions at the Central Telegraph Office of this class of traffic became a serious problem. Not only so, but the number of local offices was increasing and space became an urgent consideration.

On the average 27,000 local telegrams were dealt with daily in 1902 involving 27,000 retransmissions at the Central Telegraph Office. Accordingly steps were taken to provide a switch which would give inter-communication facilities as well as the advantage of concentration.

About 1,100 offices were connected to the switch, which was multiplied as in the case of telephone switchboards, lamp signalling indicators being utilised. The apparatus at the out offices consist of a sounder and key, together with an additional key used for calling the Central Telegraph Office. This key was furnished with a side plunger and indicator. The indicator became visible when the plunger was depressed, and remained visible until the switch operator came into circuit.

Each office included in the Switch was identified by a number, and as soon as the indicator became visible the calling operator signalled the number required on the ordinary circuit key, continuing to do so until the called office replied after being connected by the switch operator at the Central Telegraph Office. When the telegram was completed, both stations depressed the plungers of the special key, and the indicators disappeared when the connexion was cleared by the switch operator.

Each office connected to the switch was supplied with a circulation list—the number of the delivery office appearing opposite each street, &c.

The London Inter-Communication switch was the only one of its kind used in this country. It rendered very valuable service during the period when telegraph traffic was growing, but in 1923, owing to the heavy reduction in local traffic—the average daily number of local telegrams passing through the switch having fallen from 27,000 to 2,700—mainly due to the development of telephone communication between subscribers and at the smaller offices—it began to be apparent that it had outlived its utility. A careful study of the whole question was made, and it was decided :

- (i) That the switchboard should be recovered as soon as possible; the offices concerned to be connected to concentrator positions or direct circuits where such can be justified.
- (ii) That the inter-London traffic originating at the smaller offices should be inter-communicated by telephone.
- (iii) That inter-London traffic originating at the larger offices in telegraphic communication with the Central Telegraph Office should be re-transmitted at that office

The switch has now been withdrawn, and the force recovered from switch operating is sufficient to deal with the relatively small number of retransmissions imposed upon the Central Telegraph Office under this scheme.

Before leaving Morse for the task of indicating development in printing telegraph systems, a word should be said regarding experiments made in this country with the American autodot or vibroplex system.

The autodot or vibroplex key so popular amongst American operators was first tried in this country in 1908. This semi-automatic key, designed to lessen the strain of sending, was first used by American telegraphists who had difficulty in using the ordinary Morse key. The essential element is a weighted spring which is made to vibrate by the lateral movement of a finger lever in one direction, making and breaking in electrical contact with each vibration until the lever is released. The dots of the Morse code are, therefore, sent out automatically, the operator controlling the number of dots by holding the key over until the number required is signalled. The dashes are sent out by a movement of the lever in the reverse direction.

The keys are made for the "closed circuit" system of telegraphy, and it is necessary to add a transmitting relay before they can be used in conjunction with the British "open circuit" system. In order to control the number of dots sent by the automatic vibrator, the operator must hear on his own sounder the signals he is sending. The British system does not admit of this in ordinary course, and an additional sounder, which may be combined with the transmitting relay, must be provided, unless, as is sometimes practicable, the sounder provided for reception can be joined up to respond to signals sent as well as received.

Following on the inquiries of the Telegraphists' Cramp Committee, presided over by Sir John Barran, it was decided to try the system, it being understood that many telegraphists suffering from cramp and totally unable to use the ordinary Morse key, were able to send quite well on the semi-automatic key.

About the same time a Royal Commission in Australia reported on the key. They did not recommend its compulsory use by all telegraphists, but considered that it should be available for use by pre-disposed incipient cramp subjects, to provide relief before they actually broke down.

There were solid grounds for the assumption that the system might afford relief to cramp subjects in this country, and a number of telegraphists at the Central Telegraph Office, and at Cardiff, were trained in the new method of working. Some of the trainees were cramp subjects, others were young operators who had recently completed their training. Unfortunately the trial on a London—Cardiff circuit was not conclusive, the operators did not welcome the new method of working and it was withdrawn.

The arrival in this country of an American Army Signal Unit re-awakened interest in the semi-automatic key. The signal office equipment was inspected by the Chief Inspector of Telegraph and Telephone Traffic, and as a result it was decided to give the vibroplex system another trial, this time in conjunction with typewriter reception. Early in 1919, and in order that the arrangement should have every possible chance of success, two operators were very kindly loaned to the Post Office by the Officer Commanding the American Army Signal Headquarters, and the training of Post Office operators at Leicester, Nottingham, Sheffield, and Hull was placed entirely in their hands.

In the early stages of the experiment the telegraphists concerned appeared to prefer the vibroplex-typewriter combination to ordinary Morse working, notwithstanding one or two minor difficulties which were, however, soon overcome. It was reported that the new system was easier, that it caused less strain, that better results were obtainable with a smaller expenditure of energy, and that operator outputs of from 40 to 45 telegrams per operator hour were not infrequent. Typing from sound was, apparently, looked upon with favour, as being less laborious than handwriting, and, in order to make that side of the work more attractive, noiseless typewriters were brought into use.

Within a few months it became obvious that, whatever the result of the experiment, the vibroplex arrangement would have but a limited field in this country. The Start-stop printing telegraph was beginning to attract attention, and since it was thought that keyboard working would afford an even greater measure of relief from Morse working the vibroplex system, which had unaccountably

lost some of its earlier popularity amongst the staff, was abandoned. It is interesting to observe that one objection urged against the vibroplex was that it was necessary for the operator to register consciously in the mind the actual number of signals, and that the effort tended to create slight cramp in certain of the neck muscles, consequent upon the rigidity of the attitude involuntarily assumed in the concentrated act of listening.

Typewriter reception has been tried in conjunction with ordinary Morse key sending, but for some obscure reason has never become popular. It seems probable, however, that the rate of sending was never fast enough to enable the receiving operator to type at a comfortable speed, with the result that the waiting time between letters imposed a strain.

(To be continued.)

THE DEPARTMENTAL TECHNICAL EXAMINATION.

ANDREW FRASER, M.INST.E.E.

LOOKING back over the past fifteen years during which the writer has conducted the examinations for what is known as the "Departmental Technical Certificate," it may be of interest to some of the readers of this Journal to know (a) what the particular form of examination is, (b) what ground it covers, and (c) the class of individual who sits for it.

Taking these in the order named:—

- (a) This examination is a strictly departmental one, and is intended to stimulate interest amongst the operating members of the Commercial Staff in the technical side of their duties, so that when the time arrives for promotion to the higher appointments on the telegraph side they will be in a position to submit a certificate of technical qualifications in addition to the other factors taken into account in the selection for promotion. At a certain stage, further advancement cannot be obtained without the possession of this technical certificate.
- (b) The ground covered by the Official Syllabus is rather extensive, requiring on the part of the candidate a knowledge of magnetism and electricity of an elementary character; acquaintance with the various systems of telegraphy now in every day use; excepting those which are establishing their claim to permanency; a knowledge of simple testing for the location of earths, contacts and disconnections, and the methods of making faulty circuits good by crosses, etc. In addition to a three hours' written examination in which the candidate has to answer eight questions out of the number set, he is also subjected to an oral or practical examination for the purpose of seeing whether his knowledge is of a practical nature, and not merely imbibed from one or other of the current text books on the subject. If the candidate succeeds in obtaining 50% or more of the marks in each of the two parts of the examination a certificate is issued to him by the Engineer-in-Chief; and this Certificate is his indispensable passport to the higher appointments on the telegraph side. His pass is also communicated to the Secretary.
- (c) As to the class of officer who sits for examination, he must have had ten years' service before he can present himself. He may be a telegraphist or overseer at any of the large offices, or at the smaller offices where the telegraph and postal staffs are divided. Women are excluded.

It has, unfortunately, been the writer's experience to find that many of the men who, in other respects, were fully qualified for promotion, had deferred taking up the technical part until they were of an age when the assimilation of the matter is only achieved with the greatest difficulty, if it is achieved at all. The younger man, with keener all-round faculties, who is wise enough to take advantage of his youth, invariably, or almost invariably, scores over his older colleague in this respect. It is not surprising, therefore, to find that every year sees an increasing number of the younger staff presenting themselves for, and passing, this examination.

One would be disposed to think that the circumstances associated with the examination would not be other than of the most ordinary character; nevertheless, it has been characterised by humour, pathos and even tragedy. How little we realise the long sustained effort it has been in many cases to equip oneself with the knowledge necessary to secure a pass, or of the conditions under which that knowledge has been acquired. The writer can recall various cases that have come to his knowledge of the difficulties under which a man has laboured to secure the coveted certificate that will mean so much for him and his family. One of these cases was that of an officer who, after the performance of his ordinary daily duty, went home regularly to do the domestic housework, his wife being bedridden, and his little son a sufferer from a serious internal malady. No wonder that, handicapped in this way, the poor fellow failed. Nothing daunted, however, he kept on, and at the next trial was successful.

The humorous side of the subject has been largely contributed to by our Irish friends in the days before the creation of the Irish Free State. One Irishman in particular was a past master in the art of circumlocution when being orally examined. No matter how the question was framed, this irrepressible Irishman would walk round it with a flow of words spoken in a rich Irish brogue that was a refreshing relief from the usual hackneyed and memorised phrases so frequently met with. But alas! he failed to carry conviction, and had to be turned down three years in succession. On his fourth appearance he was given a gentle reminder that facts were wanted, not words. By what must have been a supreme effort he at last managed to give answers to the questions asked him in a way that enabled him to go through.

The charming irresponsibility of the true Irishman, and his utter contempt for official decorum, could not better be illustrated than in the case of a handsome though somewhat unkempt candidate who electrified the examination room by saying "Sorr, can I borrow a 'fag' from this chap!" His request was granted, for experience has shewn that if a man is to do his best, all restraints, within limits, should be removed, and he should, where possible, be made to feel that the examination is not the bugbear that imagination has painted it.

On another occasion, also in the Emerald Isle, when a candidate was asked the function of the 1,000 ohms feed resistance in the battery lead of C.B. omnibus circuits, the writer moved away a few steps so as to give the man time to think. On turning round he discovered the lady in charge of the Section apparently telling the candidate all about it. Smilingly remonstrating with her for her good intentions, she replied "Ah sure Sir, you won't be too hard on him, will you?" Who, except a Scotchman, could resist the soft blandishments of our fair Irish sisters?

The extreme nervousness displayed by some candidates is the greatest factor inimical to their success, and they take great pains to impress this upon the Examiner, little thinking that he is just as much aware of the fact as they are themselves, and in his mind is making due allowance for it. One such case occurred where it was perfectly obvious that the candidate could not collect his thoughts sufficiently to enable him to give a single coherent answer. Seeing the condition he was in, he was asked where he hailed from. "From ——— Sir." On being informed that the writer was a compatriot of his, and was pleased to see him interested in the technical side of his work, the result of the friendly remark was instantaneous, and his subsequent answers secured him an easy pass.

There are candidates—very many unfortunately—who think that the Examiner's sole object is to set technical traps for them in order to deliberately fail them. These individuals, needless to say, are those who are inadequately prepared, and who, in many cases, take a "sporting chance" and sit for examination in the hope that the paper may suit them. The oral test usually exposes them!

Before being acquainted with the examination results, candidates are prone to estimate the marks they are likely to get for their answers. Invariably they over-estimate; e.g., one man who, after carefully adjudicating, with the assistance of some one or other of his colleagues, on what he *ought* to get, placed it comfortably at anything over 80%, his actual marks gave him 64%! It may be of advantage to this type of examinee to know that full marks for a question are given only to a complete and perfect answer, nothing being allowed for divagations into side issues which have no immediate concern with the question set. Such little excursions may even result in marks being deducted from what might otherwise have been a passable answer. For example, a candidate who was required in the "paper" part of the examination to describe the construction of a Standard relay "B," after having given but a very indifferent description of the instrument, launched forth with an essay on self-induction and the time taken by a current to rise to its steady value. Such an answer is not likely to obtain the marks which would have been given had the description of the instrument been better, and the self-induction ignored.

Then there is the candidate who is convinced the Examiner is prejudiced against him. This unfortunate individual seems to forget that in nine hundred and ninety-nine cases out of a thousand the Examiner knows nothing of him whatever, and has no interest one way or the other as to the result of his examination, unless it be always to give him the benefit of the doubt, where such a doubt exists. It would surprise many of the men to know of the hours of careful thought that have been spent by the writer in weighing up doubtful cases, in order that a possible injustice might not be inflicted in these "borderland" instances.

A very common practice during the oral examination is for the outgoing candidates to communicate what they were asked to the next incomers. This proves in many cases a risky and dangerous proceeding, as the following incident will show.

The same series of questions was being put to a number of candidates who were following each other for oral examination, one of which was to find the joint capacity of two condensers when joined in "cascade." The candidate under examination who in other respects was very badly prepared, first wrote the question on a slip of paper and instantaneously gave the correct answer. Questioned as to how he arrived at the result so quickly, he replied: "Why, any schoolboy could see that was the answer." To test him further, the numerical values of the two capacities were altered, and he was asked to find the new joint capacity. After writing down all sorts of figures, he was stopped at the end of fifteen minutes and dismissed, without having been able to produce an answer. This man had clearly been primed up by those who had gone before, and the result, taken in conjunction with his other work, was fatal.

One morning whilst the written examination was well on the way, a belated candidate rushed into the room in a state of extreme perspiration and agitation, and pulling out of his pocket a matchbox containing two freshly extracted teeth, asked between his gasps for breath, if, after having endured such an ordeal, he could be expected to do justice to any examination. He was sympathetically informed that he would be treated exceptionally and examined on the following day. If the paper which this man presented next day could be published the reader would think but we will leave it at that!

On another occasion, a cheery faced optimist presented himself for the "oral" with a briskness that gave promise of good things. As he had displayed a tendency in his paper to employ algebraical notation he was asked if he was well up in algebra. "Yes" he

replied, "I was the best at quadratics in the school." He was accordingly given a question on the joining up of cells which resolved itself into a simple quadratic. After the lapse of a fair interval of time, he was found to have covered about a dozen sheets of paper with x's and y's, and was altogether in a hopeless tangle. Asked why the need for y's in a quadratic, he gave it up with a sigh. He had by some occult process transformed it into a *simultaneous equation* from which he was unable to extricate himself!

A rather curious thing happened on one occasion during a practical examination in which candidates had to measure the strength of a received current by means of the tangent galvanometer. The candidate under examination explained to the writer that he could not get the needle to lie steady. Every time he moved and shifted his position the needle did likewise. This was confirmed by actual observation. He was asked to examine his pockets for any iron or steel he might have in them. The contents were thereupon taken out and placed at a sufficiently great distance from the instrument, but without any improvement. The candidate then commenced to undress, and there is no knowing how far he would have carried this operation when he was reminded that there was a crowd of women behind him, all of whom appeared to be rather excited as to what was going to happen next. However, he was pulled up in time, and after having resumed his cast off clothes, was given an alternative question, and the examination proceeded with. The solution of the mystery was furnished by the man himself next day, who informed the writer that he forgot about a suspensory belt, having a steel ring in the interior, which he was obliged to wear, and of the existence of which he was reminded by his better half when the incident was mentioned to her in the evening!

An excellent story of the late Mr. A. Eden, the author of the old "Morning Test," may aptly be introduced here as there is a certain similarity between it and the foregoing incident.

It appears that at a certain office which must necessarily be nameless, the morning test readings taken by the "tangent" were so hopelessly inconsistent that Eden decided to investigate the trouble on the spot. He found that the officer who took the tests was a lady, who every time she leaned over the galvanometer, sent the needle swinging. He quickly diagnosed the trouble, and discreet inquiry confirmed his conclusion. The two vertical front busks of the lady's corsets were of steel, and had become converted by the earth's magnetism into permanent magnets with their N Poles pointing downwards! On his return to headquarters Eden mentioned the incident to the Chief—the late Sir Wm. Henry Preece. The comments, etc., which followed the recital of the story were characteristic of that great personality!

Too great a reliance upon text-book knowledge alone is a fruitful cause of failure on the part of many of the candidates, and the complaint, or excuse, is far too often made that they are either not allowed, or have no opportunity of familiarising themselves with test-box operations, or the actual connections of the various types of apparatus in use. Frequently a candidate when asked, say, to trace the path of a current through a repeater, will for the reason given admit his inability to do so, but offer, as an alternative, to draw the connections on paper. This, of course, cannot be accepted. A very common weakness, too, on the part of these men, who are entirely book-taught, is to venture a suggestion in answer to a question, and follow it up by saying: "isn't it?" They have to be quietly reminded that it is they, and not the Examiner, who are required to answer the questions.

One of the mistaken ideas in the minds of some candidates is that, by enlarging on the simple direct answer to a question, they may gain more marks. As a matter of fact, it very often operates in the reverse way. A man may give a correct answer, and then blurt out something else that shewed he did not properly understand the real technical point of the question, with the result that his marks are reduced accordingly.

On the whole, however, the average candidate is usually fairly well prepared. The total number of men examined between 1911

and 1925 was 2,629 of whom 1,666 passed, or practically 63%: a percentage which is fairly representative of any particular year.

This article would not be complete without some reference to the humorous side of the candidates' paper work. Not that the perpetrator desires to be facetious, although in one or two instances this objectionable weakness is noticeable, but simply because his ideas are all jumbled up and misapplied in the most ludicrous ways. A few of the latest howlers with which the writer has been confronted are accordingly given.

In the course of a description of the Leclanche cell, a candidate states that:—

"The carbon is placed in a *solution* of manganese dioxide mixed with *Binoxide*, and the exciting liquid in the containing vessel is chloride of *lime*."

This same candidate in dealing with a question on insulation resistance informs us that:—

"the insulation resistance is due to the leakage at the insulators, and works out at 4 ohms per unit which has to be added to the conductor resistance."

Replying to a question as to the function of the shunts on a differential galvanometer, another candidate claims that they are there "to reduce the self-induction of the coils, which latter retards the rate of charge and discharge and quickens the clearance of any residual magnetism in the cores."

Candidates were asked to draw a diagram of a double current simplex set with relay, and assuming the incoming current to be 20 milliamperes, to calculate the potential drop across (a) the relay (b) the entire set. The answer of one laconic student was:—

"There is no potential drop either across the whole circuit, or across the relay."

This same genius, in another question, disposes of the "time-constant" of an instrument as that which "will permit of a given current to rise to a strength of 15 m'amps."

Continuing his triumphant march through the paper he reaches the *pièce de résistance* in a question as to the nature of earth currents. "These currents," he says "are those which intermittently are joined to earth before the current has completed its course, also the magnetic effects of the earth upon a line will cause an earthy or slowing down effect." These noxious effects he eliminates "by putting more resistance in the *compensation circuit*." It will be admitted that he is pretty rough on the poor earth currents.

Another candidate states that "earth currents are slow *trickling* currents, which are overcome by the use of condensers."

To a question dealing with the construction of secondary cells, we are told that "secondary cells are formed by placing lead plates close together and ramming lead paste between them. If the cell is discharged the paste will be of a very spongy nature." The foregoing method is, however, vastly superior to the following:—

"A secondary cell is a reversible primary cell in which chemical power is restored in return for electrical energy. The ordinary type is a carbon rod surround (sic) by powdered manganese dioxide, this is encircled in a casing of zinc."

Secondary cell experts who have sedulously followed the classical work of Gladstone & Tribe and the "double sulphation" theory, will be interested in the following reactions:—

"During charge: $PbSO_4 + PbSO_4 \parallel PbSO_4 + Pb$.
During discharge: $PbSO_4 + PbSO_4$."

Even M. Féry himself couldn't sum the matter up more satisfactorily!

While on the subject of batteries, it may be mentioned that in one particular examination it was decided to test the candidates'

knowledge on fundamental points, and to this end they were asked to describe what takes place in a simple cell composed of zinc, copper and dilute sulphuric acid. The results were astounding. Many men who could tell everything about the Leclanché, or secondary cells were helpless in face of this simple question. Most of them were baffled as to the disposal of the hydrogen. Some converted it into water, others quietly ignored it and produced $CuSO_4$ on the copper plate, while others produced CuH , with an ease and confidence that must have made Daniell shift uneasily in his grave.

Occasionally the "classical" man has a look in, as in the case of a candidate who in proving his cords by the test-box tablet and galvanometer before using them for a test, said: "if there is a deflection on the galvanometer then the cords are *in statu quo*." So far as a "pass" went, he too remained in *statu quo*!

In order to measure the strength of a received current one aspirant uses the Wheatstone Bridge, and says:—

"When a balance has been obtained, the ratio arms being equal, then the strength of the received current will equal d." (d. being the *resistance* unplugged in the rheostat arm)!

The "Megger" testing instrument has suffered shamefully at the hands of a number of our technicians, as the following samples will shew:—

"To test the insulation resistance of a single line, join the line coil to line, and *earth* the distant end."

"... connect the line terminal to the line under test whilst the other is earthed. The *battery* would then be applied and the position of the indicator observed."

and so on. Unfortunately it would take up too much space to reproduce the amazing diagrams of the "Megger" which accompany the answers in many cases.

Such then, are a few of the productions of those candidates who have been badly prepared for their task. They form, fortunately, but a negligible percentage of the total number who have gone forward; and although nothing has been said of those who have done well in these examinations, this article cannot be brought to a conclusion without placing on record the fact, that, apart from the general work being of fairly good quality, there emerges at times work of a super-excellent order by men who are not only a credit to the telegraph service, but who would indubitably bring credit to themselves and to their work in any other sphere of life.

The technical examination has on more than one occasion been the means by which a man has been able to get early out of the rut and obtain the advancement he merited, but for which he might otherwise have had to wait many years, if he ever got it at all. Of course technical qualifications are not the sole desideratum when the question of promotion arises. The capability of dealing with traffic, and the handling of staff are equally important factors; but, with occasional exceptions, it has been observed that the men who have done well in the technical work have proved themselves equally fitted in these other directions.

One sinister aspect of the technical examination cannot, however, be allowed to pass unnoticed; that is, the efforts that have been made at various times—fortunately the instances are rare—to obtain favourable consideration for particular candidates by those whose positions entitle their words to carry weight; and candidates themselves have not been altogether free from adopting methods that were calculated to achieve the same end. Such procedure, needless to say, *always* frustrates its own ends. Written appeals are consigned to the flames unacknowledged, and a deaf ear is turned to the others. Every candidate, no matter what his rank, is treated absolutely impartially, and will be judged on his merits alone, irrespective of any extraneous influences, whether these are adverse or favourable to the man concerned. It is the only way.



A SPECIAL EVENT.

[Photograph reproduced by courtesy of F. Parkin, Torquay.]

A SPECIAL EVENT.

On Saturday, Oct. 31, 1925, the Torquay and Paignton exchanges, two adjacent exchanges in the Western District, were changed from manual working to automatic conditions. The change-over was made the occasion of a public ceremony: the Mayor of Torquay, Councillor E. H. Sermon, gave the signal for the change-over from the telephone at his residence. He then spoke to the Mayor of Exeter. The new Automatic Telephone installation was subsequently officially explained to the visitors, including, in addition to the Mayor of Torquay and the Chairman of the Paignton Urban District Council, some 30 members of the Torquay Corporation; Paignton Urban District Council and other public bodies. Representing the Post Office were Mr. J. G. Laithwaite, the Surveyor of the Western District; Mr. E. J. Eldridge, the Superintending Engineer of the South Western Engineering District; Mr. G. A. McDonald, District Manager for Telephones; Mr. F. H. Wise, Sectional Engineer for Exeter District; and Mr. C. A. C. Hamblen, Postmaster of Torquay.

The installation at Torquay, which is in the Post Office, comprises 19 Strowger units equipped with rotary line switches and final selectors. Of the 1,800 lines provided for, 1,600 are for ordinary subscribers and 200 for private branch exchanges. Provision is also made for 50 Coin Box Circuits, the coin boxes being of the "Hall Multi" pattern.

The transfer was effected very satisfactorily; there being but few faults.

The Officers immediately in charge were Mr. R. T. McCahey, of the Engineering Section, and Mr. E. B. Lord, of the Traffic Section.

MIDDLESBROUGH TELEPHONE DISTRICT.

Mr. W. Brodie (Contract Manager Class IV) on the eve of his departure from Middlesbrough to take up new duties at Gloucester, consequent upon his promotion to the higher scale, was, on Sept. 29, the recipient of a large leather travelling case subscribed for by the District Office Staff.

Mr. H. G. McFarlane (District Manager), in making the presentation, made pleasing reference to Mr. Brodie's abilities and genial disposition, and spoke highly of his devotion to duty during the 9 years of his sojourn in the district. Mr. T. Hann (Chief Clerk) was absent on annual leave, but a letter was read expressing regret at his own absence, and conveying wishes of success and happiness both to Mr. and Mrs. Brodie in their new sphere. Messrs. Burdett (Overseer), Gunson (Contract Officer), and Frame (Asst. Traffic Superintendent) each conveyed personally to Mr. Brodie on behalf of the officers employed in the representative branches of the District Manager's Office their expressions of cordial goodwill and wishes for the happiness and success of Mr. and Mrs. Brodie.

A touch of humour was lent to the proceedings by Mr. Frame's reference to the "Brainy Traffic Section" (amidst a chorus of groans) and his reading of several couplets and limericks, the authorship of which he ascribed to various other members of the Traffic staff, but in view of the many indignant disclaimers overheard, it was shrewdly surmised that he had more to do with the authorship than was admitted.

Mr. Brodie, in replying, spoke feelingly of his associations in the district, and with the staff, of whom he had come in contact—many familiar faces and old friends would be missed, but he hoped that the same feeling of comradeship would be extended to his successor. In thanking the District Manager and staff for their parting gift and kind wishes, he mentioned that the travelling case although large was not sufficiently capacious to hold all his recollections of Middlesbrough, but that it was pleasing to add that it would undoubtedly accommodate a large proportion of more practical necessities in transit, and, in conclusion, that all aspiring members of the District Manager's staff were, in his opinion, potential Supervisors fully qualified to fill higher posts of responsibility, who would at some future date, not too far distant, climb the high and dizzy pinnacles of promotion and share with him the realisation of that elusive goal toward which so many are perseveringly striving, and he truly hoped they would all receive the full official recognition their good works deserved.

EDINBURGH AND DISTRICT POSTAL TELEGRAPH AND TELEPHONE SOCIETY.

The opening meeting of the above Society was held on Tuesday, Nov. 17, in the Telegraph School, G.P.O. This year the Society has extended its syllabus so as to include items of interest to all sections, postal, telegraph, and telephone. Despite a record fog which prevailed and made it really dangerous to venture abroad, there was a good gathering of various grades of the staff. Lt.-Col. A. A. Jayne, D.S.O., O.B.E., M.C., Controller Edinburgh P. and T. District, gave the opening address on "Publicity and Public Criticism." The address was well received and the discussion which followed was excellent, all grades participating. The evening was a complete success, and augurs well for the future meetings of the session.

CHESTER.

Mr. James Morris, of the District Manager's Office at Chester, has been appointed a Member of the Executive Committee of the Savings Associations for the City of Chester. Mr. Morris has been Hon. Secretary of the Chester District Manager's Office Savings Association since October, 1919. The Association, which was formed in February, 1917, with a membership of 27, now has a membership of 75, and to Sept. 30, 1925, £2,900 10s. 0d. has been subscribed by the members.

PHILIP REIS: A FORGOTTEN GENIUS.

BY J. SKINNER (*Brighton*).

It seems ever the aim of man to attempt the apparently impossible whether it be in the direction of mechanics, science or human endurance. Nearly two thousand years ago Horace wrote:

"Nought is too high for the daring of mortals:
Heaven's very self in our folly we storm,
Never is Jove, through our guilty aspiring,
Suffered to lay down the bolt we provoke."
(*Book I, Ode III*).

To-day when we enjoy the fruits of the labours of those geniuses who have contributed so much to our twentieth century comfort and convenience; when we can fly across to the Continent on payment of a few pounds; or obtain a wireless receiving set for a small sum and forthwith extract amusement and instruction from the ether ad libitum, we are apt to forget the struggles of those pioneers who made these seeming miracles possible.

Philip Reis, the subject of this brief notice, was born in Germany in the early part of the last century of parents in lowly circumstances, and after many struggles became a schoolteacher. What led him to experiment in the direction of the transmission of sound along wires we do not know. We can imagine, however, that having once grasped the idea, the ill-health from which he habitually suffered could not damp his enthusiasm, and that he pressed forward, unfortunately on wrong lines, until death intervened. The people in the far off fifties doubtless laughed at him and considered him an eccentric and foolish fellow. It is a fact though that he came close to success without reaching it. As an American writer on the subject points out; "Reis evidently did not know how to make the vibrations of his diaphragm translate themselves into exactly commensurate and co-related electric impulses of equal rapidity, range and quality. If he had done this, he would have had a speaking telephone, but a make-and-break contact could never do it, and hence he in his later instruments attached to them a telegraphic key in order that the sending operator might communicate with the receiving operator." (*The Progress of Invention in the Nineteenth Century*, E. W. BYRN). It will be seen then that the poor schoolteacher, for such Reis was and remained until the day of his death, was groping in the dark after the great possibility which he knew must exist.

Reis was keenly interested in physics, and about the year 1852 experimented with an endeavour to make the vibrations on one diaphragm produce corresponding changes in an electric current, and to make the varying current reproduce sounds at the distant end of the circuit. We are fortunately able to mention the "apparatus" this man with a vision had at his command. Professor Barrett, in a lecture delivered some fifty years ago, said, referring to Reis's instrument: "The first telephone was of a most primitive nature. The originating instrument was a bung of a beer barrel hollowed out, and the cone formed in this way was closed with the skin of a sausage, which did service as a membrane. To this was fixed with a drop of sealing-wax a little strip of platinum, representing the hammer of the ear, and which made or broke the electric circuit, precisely as in the instruments of a later date. The receiving instrument was a knitting needle surrounded with a coil of wire and placed on a violin to serve as a sounding-board." With such a collection of "accessories" to work upon it is perhaps surprising to find that Reis actually did invent a telephone of a sort. Its functions were, however, strictly limited.

The writer has a valued friend who was a pupil in the school where Reis taught many years ago, and who has kindly furnished some interesting facts concerning this remarkable man. Professor Reis, as he was generally called, taught chemistry and physics at L'Institut Garnier, a French college at Friedrichsdorf, near Homburg.

The college was a large one, and among its numerous pupils about forty English boys were usually to be found. It was freely rumoured amongst the pupils that Reis was at one time a shoemaker's apprentice and that he ran away from home to follow the studies so dear to him. Whether this is so or not we have no means of ascertaining, but it is true that he was an enthusiastic scientist, possessing a profound knowledge of the subjects he taught. He is described as being rather below the average height. He was consumptive, and always in a poor state of health. This doubtless was the cause of his usual irritability and peculiarity of temperament, for he is said to have been a difficult man to get on with. His lectures were, however, made particularly interesting to the students by the numerous experiments which always accompanied them. Reis believed in practical demonstrations and the boys had plenty! There were many weird and impressive happenings in that class room, and the writer's friend, even after an interval of over fifty years, clearly recalls the striking experiments in heat and sound he was privileged to witness. The apparatus was usually made by Reis, who possessed quite a museum of scientific instruments and all kinds of "specimens." He did not live in the college where the other masters resided as a matter of course, as he refused to accept any restrictions which would interfere with his private studies.

As a master he was very strict. On one occasion the writer's friend threw a stone which nearly hit Professor Reis who unluckily came around the corner just at that moment. The professor called the culprit to him and said: "After a stone is thrown its destiny is in the hands of the devil. Now go and write those words one thousand times."

For several years wires used by the professor in his experiments stretched across the school ground, and he was credited by the boys with the power of being able to hear what they were talking about in their dormitories. This, of course was doubtless incorrect, as his telephone at best could only transmit musical sounds.

After several years of ill-health, Reis died of consumption in the early seventies, and before passing away expressed a wish that none of the boys at the school should attend his funeral! Could he have lived but a few years longer he would have seen his dream realised, for as readers of the *Journal* are doubtless aware, Professor Bell took out a patent in March, 1876, for a practical telephone.

We in the public service serve a hard and not always a well-informed master. The British Public demands a great deal in the way of service and sometimes its sweet unreasonableness is, at least, very trying. We do not, and indeed cannot, always see eye to eye with the man in the street, and our old friend "Constant Reader," but this has apparently been the case all the while society has existed. Theognis, who was born about B.C. 570, said:

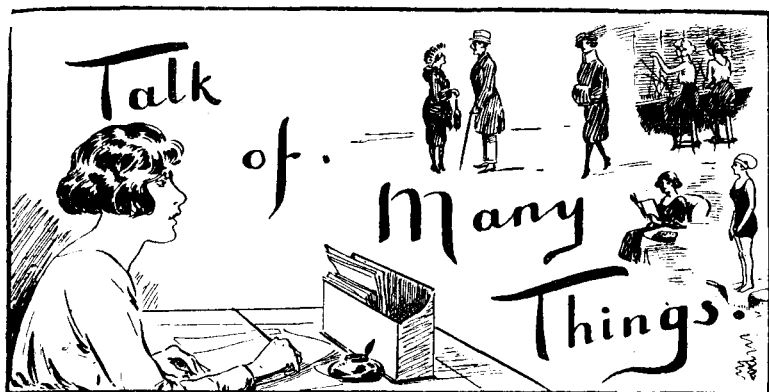
"The city's mind I cannot comprehend.
Do well or ill, they hold me not their friend.
From base and noble blame is still my fate,
Though fools may blame, who cannot imitate."

Theognis, who we are told, had many ups and downs during a stormy career, appears to have summed up the public attitude of his time—and of all time—in a remarkably accurate manner.

Criticism of the public services is plentiful to-day, thanks largely to our newspapers. It seems possible though, that the power of present day criticism represented by a section of the Press, may soon be undermined by the very instrument that Reis attempted to invent—the telephone. When the world "listens in" it may hear the truth more often than it reads it at the present time!

Has the poor stricken school-master, teaching a class of unruly boys by day and struggling with his sausage skin and beer bung apparatus by night left, a message for us to-day? Surely he did, and it can be expressed in the words of Dr. R. P. Downes thus: "We are responsible, each according to his own opportunity, for some honest effort made to leave this sad world happier, this evil world better than we found it. In this war, slackness is infamy, and power, to the last particle, means duty."

WE TELEPHONISTS



That 1,400!

EVERYONE concerned is working hard on the production of Miss McMillan's telephone play which is to be given at St. George's Hall, Tottenham Court Road, at 7 p.m. on the 11th of this month—and repeated in January next if by that date the membership of the London Telephonists' Society reaches 1,400, the number required to justify the cost of a second performance.

Everything points to a repetition of last year's success on even a larger scale. The "cast" of the play has been augmented. Not only are we to have the help of those able artists and tried friends of the Society, Miss Blair-Street and Messrs. Beale, Cracknell, and Beck, but also that of Mr. Hemsley, whose fine voice is known throughout the London Telephone Service. Miss Clayton, artist in another medium, will once more be Mistress of the Robes.

Rehearsals under the able direction of the producer, Mr. Pounds, are now practically completed; and all that is needed is a fine day on Dec. 11—and 1,400 members of the London Telephonists' Society by the end of the year. On the basis of last year's membership, this means that each of last year's members must make a point of securing 0.27 of a new member—not a great deal, surely, in spite of the repeating decimal! Indeed, the "repeating" decimal is quite appropriate and stimulating.

P. D'A.

Where Draughts go to in the Winter time.

Cold, draughty, bleak Winter is here again, and don't I know it! Here again, reviving all those vexed questions of ventilation. I have come to the sad conclusion that my colleagues at the office do not consider my well-being as they should. Every day, "just for a few minutes," they insist upon opening the window behind me to let the fresh air in. If my working hours were proportionately as long as those few minutes I would only be able to see the Old Folks at home every Christmas. In common with most people I like fresh air, but I like to take it in the usual manner, not in bleak gusts down the back of my neck. It doesn't do one the same good that way.

It is a fallacy that no one knoweth whence the wind bloweth or where it bloweth to. I know that in the winter time it bloweth down my back from yon open window. I daren't remonstrate about it. I did once, and was met with a torrent of abuse about the room being stuffy and full of deadly microbes. Whereupon I promptly sneezed another battalion of microbes into the air, thinking to win sympathy and get the windows closed. But some facetious person referred me to the advice given by some stuffy doctor that I should wear a veil!

Happily, I am not the only one in the room who dislikes open windows. When the inevitable argument arises on a cold day as to the merits and demerits of germ-laden air and cold draughts, stiff necks and influenza, it always finished at a deadlock;—One half the staff vow they will die of suffocation if the windows are shut, and the rest anticipate early graves as a result of pneumonia.

There seems to be only one solution to the difficulty, and that is, that we obtain a disinterested person to open the windows and kill one half the staff and then shut them and kill the rest.

E. A.

Toll Exchange.

A most enjoyable concert, arranged by the Committee of the Renown Swimming Club, was held on Thursday, Oct. 15 in the Toll Exchange Dining Room (kindly lent for the purpose) on the occasion of the annual prize distribution.

Members and friends contributed much-appreciated items to the programme, which included:

Pianoforte Solos	Mr. H. Dicks
Songs	Misses Hawkins and Meiklejohn and Messrs. Harrison and Collins.
Child impersonations	Miss Cridland.
Monologues	Mr. Crouch.
Violin Solos	Miss Godfrey.

The prizes (won at the recent Trunk and Toll Exchanges combined swimming gala) were distributed by the Chief Supervisor, Miss Epps, the Service Superintendent, Mr. Rooney, making the necessary announcements. Prizewinners were:—

Learners' Race	(1) Miss Sutton. (2) Miss Northwood.
Club Diving Championship	Miss Cowper.
Balloon Race	(1) Miss Domminey. (2) Miss Hawkins.
Old Clothes Race (Funniest Costume)	(1) Miss Weedon. Miss Cowper.
Club Handicap	(1) Miss Ellis. (2) Miss Meiklejohn. (3) Miss Sutton.

After the distribution, the captain of the club, Miss McKelvie, presented a bouquet to Miss Epps, who responded with a delightful speech of thanks. Miss Epps alluded to the proud achievement of the Toll Swimming Club, with somewhat overwhelming odds against them, and expressed a hope that more intending members would enrol, and so help towards increased activities next year. Mr. Rooney remarked that swimmers appeared to vary their accomplishments in a very able manner.

Refreshments were served, and the proceedings closed, everyone feeling that the committee deserved a vote of thanks for such a well organised and successful evening.

A. G. T.

Sydenham Exchange.

Truly Sydenham is waking up! The combined committees of the Tennis and Swimming Clubs organised a dance which took place on Nov. 4, at the Dartmouth Hall, Forest Hill. In spite of the rain, supporters turned up from various exchanges in the district, and a very successful evening was the result.

Mr. Buckeridge, in presenting the Swimming Club prizes, expressed pleasure that Sydenham had made a beginning.

Miss J. Piccard, our champion swimmer, was unable to receive the prize she won at the L.T.S. gala at the general prize-giving, so it was formally presented to her by Mr. Buckeridge. Although we should have liked her to have taken her prize with the other exchanges, we were pleased to see the first prize won by Sydenham presented at the first dance attempted by the exchange. The committee have reason to congratulate themselves on the financial success of the dance. Both the Tennis and Swimming Clubs will be materially assisted. A word of thanks is due to those who gave up their time in the afternoon to prepare refreshments. Their willing service largely contributed to the splendid spirit which prevailed throughout the evening.

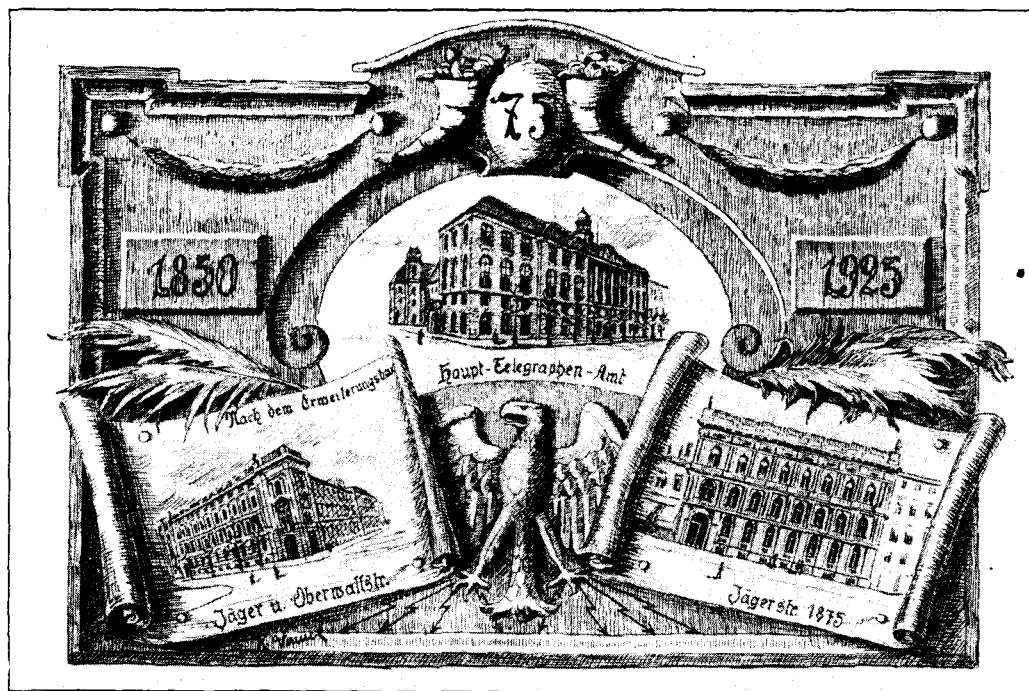
The Committee would like to thank Miss Bowley for the keen interest she took in the organisation of the dance, and no doubt, under her guidance, Sydenham will soon rank first among the mighty and the great.

G. M. T.

The following verses were found written on a scrap of paper on the floor of one of our exchange switchrooms. The author is unknown; but the quality of her work makes us hope to number her among our regular contributors. Sydenham will have to look to its laurels!

A Learner's Song.

I nothing knew; I went to School,
To be once more a slave to rule,
But childish things I did not learn—
My teacher was not old nor stern
But young and very sweet.
My lessons on one subject were,
They filled my heart with black despair—
Such things as brains seemed very rare,
And kept for the Elite!



Souvenir of the seventy-fifth anniversary of the opening of the Central Telegraph Office, Berlin, Nov. 15, 1850. Centre: The first building. Right: Second building in Jäger Strasse. Left: The extension of the Jäger Strasse building into Oberwall Strasse.

The above reproduction is the replica of an excellent sketch issued by the Berlin Haupt Telegraphen Amt to celebrate three-quarters of a century of telegraphic development, upon the occasion of which event we offer our fraternal congratulations.—ED. T. & T. J.

That instrument, the telephone,
Most complicated terror known,
Was all I had to think about—
I sometimes had a dreadful doubt
That I should ever be
As really competent and good
At taking numbers as I should,
Though I determined that I would!
I had to "wait and see!"

We all were trained in speech and deed,
We tried to specialise in speed:
But accuracy counted too.
We kept it always in our view—
Yet—something else came first!
And all else paled beside the word,
Neglect it? why, we never dared,
'Twas *Courtesy*—and ill we fared,
Were we not well rehearsed.

Our salutation "Number, please?"
Was meant to soften and appease,
We sounded happy, full of will
To help Subscribers have their fill
Of numbers—all O.K.!
Articulation? brisk and clear,
A slight mistake? well, never fear,
We were "so sorry—didn't hear—"
Yes, just a *slight* delay!

And then our last day really came,
They turned us out to seek for fame,
To operate in earnest—but,
We soon were dragged within the rut—
'Tis *this* one hears, and sees—
"A number wrong?—I can't help that!"
You gave it wrong—not *me*, that's flat!"
She cuts them off—then really pat
Comes once more "*Nummerlees*?"

More Sermonettes.

With apologies to Miss G. M. Turner—and others.

Play fair, O Mayfair,
Lest thou should'st be found out. Thrice is he armed
Who hath his quarrels just . . . Be sure that policy
Is the best Honesty.

Give of thy uplift, Upminster!
Send through the welkin wide thy clarion call;
To the blue empyrean send thy thought!
Work out thy peg-count truly.

Speed well, O little Speedwell!
Yet not too well; for, so the wizards say,
More haste less speed. See that thy answering time
Exceeds not by one half an atom's breadth
(Say) foer point fife oh oh.

P. D'A.

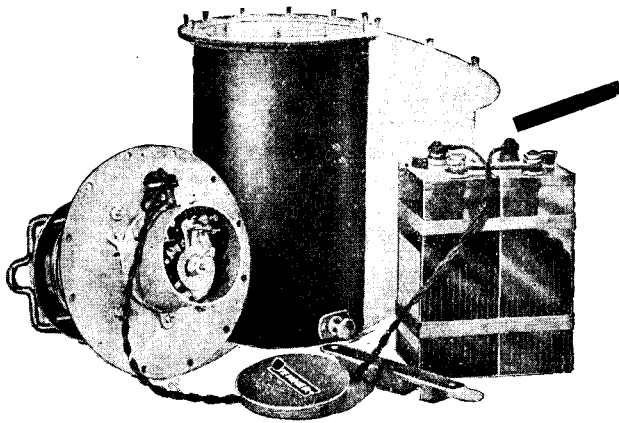
Photographic Competition.

There has been a considerable dearth of entries in this competition. Perhaps it is not generally realised that entries for the Happy Holiday Competition (in connexion with the London Telephonists' Society) are also eligible for the above competition, the closing date of which has now been extended to Jan. 14 1926.

Contributions to this column should be addressed: THE EDITRESS, "Talk of Many Things," Telegraph and Telephone Journal, Secretary's Office, G.P.O. (North), London, E.C.

PRESENTATION TO MISS F. LEES.

Miss F. Lees, on leaving Manchester to take up her new position as Higher Clerical Officer at Nottingham, was presented by the District Manager's Office Staff with a cut glass electric reading Lamp and a pair of silver candlesticks. Several other beautiful gifts were presented to her at the same time by individual members of the Staff with whom she was particularly associated. Miss Lees has seen 16 years' service in Manchester, and left with the heartiest good wishes of the staff for her happiness and success in her new sphere of duties.



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LONDON TELEPHONE SERVICE NOTES.

Armistice Day.

AGAIN this year the anniversary of the 1918 Armistice was solemnly observed throughout the service.

The exchanges were silent for the two minutes following 11 o'clock, and the staffs' tribute to those who passed into eternal silence took the form of wreaths and flowers at the two Rolls of Honour at Headquarters. The Controller, attended by Miss Henwood, representing the women, and Mr. E. S. Abbott, representing the men, placed a wreath on the Cenotaph.

The balance of the fund from which these tokens are provided has been given to the Post Office Relief Fund in its entirety.

* * * *

London Telephonists' Society.

The second meeting of the Session, held on Nov. 6, proved such an attraction that the attendance overflowed the available accommodation. Two current topics were debated. Firstly, "Are we over standardised?" by Miss C. K. Hooper and Miss A. E. Knapman, and secondly, "Will Automatic Exchanges prove a blessing to Telephonists?" by Miss E. Cane and Miss E. M. McAllister. Full justice was done to both sides of these questions by the respective leaders, and there were many interesting contributions to the debates from the body of members.

It is quite evident that the programme arranged this year appeals to the popular taste, and from the point of view of the attendance, the session is likely to prove one of the most successful in the Society's long existence.

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The Motor Show at Olympia.

The busiest week in the year at the Riverside Exchange is that in which the Motor Show is held at the Olympia. This year the exhibition was open from the 8th to the 17th October.

In the Exchange a special suite of nine "A" positions are installed exclusively for exhibition traffic. The number of direct exchange lines provided for stall holders this year was 372. In addition, 15 call offices (including one in the Exhibition Post Office) were available for the use of exhibitors not renting lines, and visitors. Nine of these call offices were fitted with multi coin boxes and the other six were under the control of an attendant.

The staff at Riverside was augmented by 11 telephonists, and 48 additional outgoing and 55 incoming junctions were provided to deal with the Exhibition traffic.

Enquiries for exhibitors' numbers were dealt with at the Directory Enquiry Centres, where lists containing the necessary information were available. In addition, staff was specially detailed at the Riverside Exchange to answer such enquiries as filtered through to that point.

The number of outgoing calls dealt with during the exhibition was 48,745; incoming calls totalled, approximately, 55,000. The exhibition busy hour as regards telephone traffic did not coincide with that for the Exchange. The latter covered the period 10-11 a.m., when the number of exhibition outgoing calls dealt with was about 700. The volume of traffic at the Exhibition reached its maximum between 11 and 12, when the number of outgoing calls reached a figure between 1,000 and 1,100.

Observations taken whilst the Exhibition was in progress indicated that a very good service was given, and general satisfaction was expressed by the public. The average speed of answer was 3.2 secs. (97.3% of the calls were answered in 10 secs. or less) and the clear was 4.3 secs. A word of praise is due to the Exchange Staff for the excellent service rendered.

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Swimming Prize Distribution.

The prize-winners at the recent L.T.S.S.A. Gala attended a dance at Australia House on Friday, Oct. 30, and during the evening received their awards from the Female Staff Superintendent, Miss A. Cox. The Association is indebted to Miss Cox for her unfailing regularity in officiating at this annual function and also have to tender their thanks to her for the cup she has presented to be held each year by the best learners.

It is a privilege to record that L.T.S. swimmers are making their mark in events open to the whole of the Civil Service, and the following successes have been won during the past year.

100 Yards Championship (free style): Miss Williams (Regent) 2nd.

100 Yards Championship (breast stroke): Miss House (Regent) 1st; Miss Wilson (Gerrard) 2nd.

Diving Championship: Miss Williams (Regent) 1st; Miss Davis (Gerrard) 2nd.

PERSONALIA.

LONDON TELEPHONE SERVICE.

Promotion:—

Miss S. I. WILLIAMS, Superintendent of Typists, Secretary's Office, to Chief Superintendent of Typists, London Telephone Service.

Promotions to Asst. Supervisor, Class II:—

Miss E. M. UTTIN, Clerkenwell Exchange.

Miss ANNIE E. SMITH, Clerkenwell Exchange.

Miss G. MOORCOCK, Ravensbourne Exchange.

Miss M. C. HINE, Wembley Exchange.

Miss H. T. ROPER, Royal Exchange.

Miss E. M. DAWKINS, Avenue Exchange.

Miss L. I. SMAILS, Victoria Exchange.

Miss M. M. COX, Museum Exchange.

Miss L. A. ROGERS, London Wall Exchange.

Miss E. L. HOLKHAM, Gerrard Exchange.

Miss E. SMITH, London Wall Exchange.

Miss EDITH A. WATSON, Museum Exchange.

Miss E. BANNISTER, Kensington Exchange.

Miss A. E. KNIBBS, Victoria Exchange.

Miss A. M. P. STANDEAST, Avenue Exchange.

Miss E. A. R. MOSS, Langham Exchange.

Miss E. EDWARDS, London Wall Exchange.

Miss V. RATHBONE, Clerkenwell Exchange.

Resignations on account of marriage:—

Miss E. L. THOMAS, Assistant Supervisor, Class II., of Trunk Exchange.

Miss A. PARKER, Assistant Supervisor, Class II., of Paddington Exchange.

Miss M. L. POWELL, Assistant Supervisor, Class II., Victoria Exchange.

Miss B. V. G. SANKEY, Telephonist, of Trunk Exchange.

Miss M. E. S. JONES, Telephonist, of Paddington Exchange.

Miss A. L. WHEELER, Telephonist, of Paddington Exchange.

Miss I. M. B. ISOM, Telephonist, of Victoria Exchange.

Miss C. E. MANSFIELD, Telephonist, of Victoria Exchange.

Miss A. L. DORAN, Telephonist, of Victoria Exchange.

Miss A. G. MUTH, Telephonist, of Victoria Exchange.

Miss D. A. SIGLEY, Telephonist, of Victoria Exchange.

Miss F. D. FINCH, Telephonist, of Palmers Green Exchange.

Miss F. P. PURSER, Telephonist, of London Wall Exchange.

Miss E. R. SAWYER, Telephonist, of Bartholomew House Exchange.

Miss E. E. HARTLEY, Telephonist, of Regent Exchange.

Miss C. L. WOODS, Telephonist, of Regent Exchange.

Miss E. M. DOUBLE, Telephonist, of Regent Exchange.

Miss M. E. STREET, Telephonist, of Regent Exchange.

Miss F. HOWARD, Telephonist, of City Exchange.

Miss M. V. FARMER, Telephonist, of City Exchange.

Miss E. ANN WARRELL, Telephonist, of Gerrard Exchange.

Miss M. L. VINCENT, Telephonist, of Gerrard Exchange.

Miss N. F. GENTLE, Telephonist, of Gerrard Exchange.

Miss M. M. U. FITZPATRICK, Telephonist, of Gerrard Exchange.

Miss E. W. HILL, Telephonist, of Gerrard Exchange.

Miss D. R. HOLDEN, Telephonist, of Park Exchange.

Miss D. A. WARWICK, Telephonist, of Park Exchange.

Miss E. V. WATERS, Telephonist, of Museum Exchange.

Miss J. H. LAY, Telephonist, of Wanstead Exchange.

Miss F. A. ABSOLAM, Telephonist, of Trunk Exchange.

Miss F. M. HURRELL, Telephonist, of Trunk Exchange.