THE

Telegraph and Telephone Journal.

VOL. XIII. MAY, 1927. No. 146.

CONTENTS.

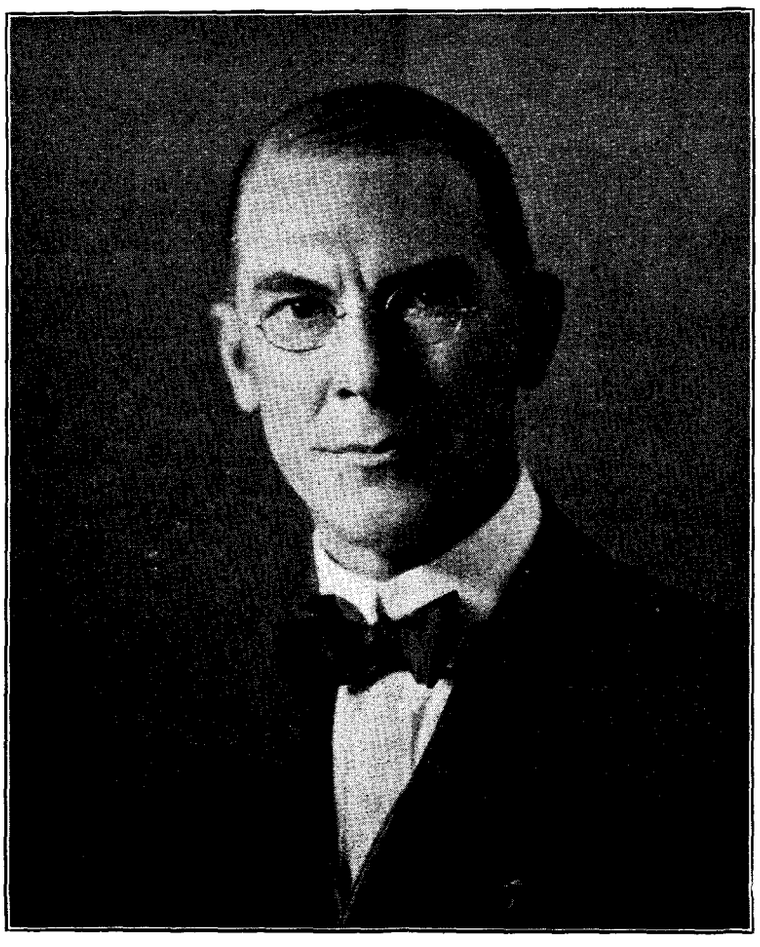
Subscription: To the public, 5s. 0d. per annum, including postage. To the Staff, 3s., including free delivery to any Post, Telegraph, or Telephone Office. Single Copies: To the public, 4d. each, or post free 5d. To the Staff, 3d. each. Orders should be sent to the Managing Editor, TELEGRAPH AND TELEPHONE JOURNAL, *G.P.O. North, London, E.C.*1.

All correspondence relating to advertisements should be addressed to MESSRS. SELLS, LTD., 168, *Fleet Street, London, E.C.*4.

TELEGRAPH AND TELEPHONE MEN AND WOMEN.

XL.—

MR. WALTER ERNEST WESTON.



MR. WALTER ERNEST WESTON, Principal in the Secretary's Office, whose portrait we present this month, was one of the small but select band of men who, on the transfer of the National Telephone Company's undertaking to the Post Office on Jan. 1, 1912, were allotted to G.P.O. Headquarters, Mr. Weston becoming a Second-Class Clerk, Higher Grade, in the Secretary's Office.

Mr. Weston, when with the National Telephone Company, was the statistical expert, and naturally the same responsibilities were assigned to him on his transfer to the Post Office. He did much valuable work in connexion with Parliamentary Select Committees on Telephone Rates. Indeed, Mr. Weston has such a *flair* for telephone statistics that, on his promotion to a First Class Clerkship, his separation from them in order to take up other duties presented considerable difficulty. Mr. Weston was ultimately transferred to the Overseas Telegraph Branch and it soon became clear that his ability in connexion with statistics was merely the manifestation of one side of a brain of a very high order. Mr. Weston is now concerned with the wireless services and he was the Secretary of the recent commission which dealt with the future of broadcasting. He was promoted to the grade of Principal on April 1, 1920.

Mr. Weston is interested in all forms of sport and is a golfer of no mean ability.

THE IDEAL HOME EXHIBITION,

MARCH 1-26, 1927.

BY OLI-DAILE.

No. 95 in the Main Hall at Olympia was a Telephone Development Association Stand to which thousands of visitors were attracted by the free ballot advertised in the Press.

Two officers representing the London Telephone Service were deputed to attend and secure signed contracts for exchange services required in the London area and record Provincial inquiries.

Many grievances were aired on Stand 95 during the four weeks of the Exhibition and readers of the *Telegraph and Telephone Journal* may be interested in some of the expressions of opinion of which we, the L.T.S. representatives, were the willing, or unwilling recipients.

Generally, the Post Office Telephone Service was well spoken of, one gentleman, obviously not a Civil Servant, stating that he would rather do without two suits of clothes each year than dispense with his telephone. Another gentleman, when asked if he was interested in telephones, replied: "Yes, just so far as to say that they are an infernal nuisance and the less I have to do with them the better I like it." To do justice to the grievances of one lady connected to the Redhill Exchange would need a special edition.

Inquiries regarding completion of installations on order were fairly frequent and in some cases were accompanied by strong comments. We dealt with these as tactfully as possible, sometimes finding it convenient not to reveal our identity. It was very refreshing, however, when one gentleman looked in to say how indispensable his telephone had been during illness following an accident. He was delighted because the 'phone was installed in four days.

Landlords appear to be doubtful blessings. One subscriber was in trouble on account of his landlord threatening to have all wires removed from the premises, thus endangering the continuity of his tenant's telephone service. Several enquirers, too, seemed to be worried about "whether their landlords would object to a telephone being installed"; but we think the landlord, not of British nationality, who charges his tenants 6*d*. for calling them to answer the 'phone after 10 p.m. has, with our help, induced one of his tenants to become a subscriber.

We interested many people in the manipulation of automatic telephone dials, but had also to deal with a constant stream of inquiries about "gadgets." One subscriber who inquired about an appliance which is not on the authorised list, on being so informed, laughingly replied: "Oh, that's alright. We know when your Engineers are coming, and the ——— is taken off before they arrive, and put back after they leave." This subscriber appealed to us more than the one who, hearing us explain the different tariffs for business and residential telephones to a friend of his, confessed that he was unaware of the different rates, adding that he originally rented a residential connexion but had had this removed to his business premises without increase in rental. The honest man flatly refused to give his telephone number!

The H.M.T. (hand-micro-telephone) type of telephone was often mentioned. Many people seem to prefer this type of instrument. One gentleman showed us his sleeve shiny at the elbow and said it was due to his having to use the present type of telephone. We sympathised: we are accustomed to shiny coat sleeves ourselves but don't blame the telephone for them. Occasionally, however, we came across lady subscribers who prefer the candlestick pattern instrument. Sleeves, of course, are a negligible quantity with the fair sex.

Questions of all sorts were asked about the ballot. Perhaps the most humorous was this: "I am a Sviss. If I vin, do I take the telephone to Svitzerland?" A certain actor caused some amusement. He had partially filled in an entry form when, being recognised as a subscriber, he was informed that the ballot did not apply to renters of existing telephones. He jocularly said that we had blighted his life and departed, returning almost immediately to snatch up his signed entry form (which in a few minutes would have been in the wastepaper basket) with the remark: "I make a charge for my autograph."

Perhaps the culprit who walked off with the hospital box and its contents realised the odds against success in the ballot and was seeking compensation!

We must mention our imitation log fire which was a certain Gas Co.'s exhibit. Oh, that gas fire! It nearly scorched us, nearly set the stand alight on one occasion, and caused much gnashing of teeth when having, as we imagined, succeeded in interesting prospective subscribers in the all-important telephone they suddenly exclaimed, "Oh, what a beautiful gas fire." We mentally substituted another adjective and then agreed. However, it was the innocent cause of one delightful question. A caller asked, "Are the logs made of aspidistra?"

Applications from all sorts of people were dealt with. One young man was very anxious to sign an agreement for a telephone to be installed in his father's house. When it transpired that his business or occupation was "Out-of-work clerk" we tactfully suggested that it would perhaps be better if his father signed the agreement. Ladies are very keen on telephones and many were anxious to arrange for their husbands to be "tactfully" approached. We noticed that we were generally successful in obtaining orders when husband and wife were together. One gentleman who was not anxious for a private house connexion, told us that his wife was so keen on it, that for him it appeared to be either a telephone or a divorce. We obtained his order, and hope he will decide that he has chosen the lesser of the two evils.

One lady wanted the telephone installed on April 31. We regretted it could not be done but took her order for May 1. She was a L.C.C. headmistress, too!

Altogether we secured over 100 signed agreements for exchange lines, and a few extensions. We also dealt with about 250 promising inquiries, most of which should result in business. We left the Exhibition on Mar. 26 feeling that we had justified our presence there. We certainly performed useful work in preparing the ground for the cultivation of the telephone habit, and exploded many of the old ideas which still exist about minimum calls, installation costs, and heavy initial charges. We also presented "the other side" to those subscribers who complained of overcharges in their accounts for calls.

BROADCASTING IN POLAND.

THE Polish Broadcasting Company (Poleskie Radio) have just placed a contract for a 10-kw. broadcasting station to be erected at Katowice. It is interesting to note that this equipment will be manufactured in London, at the works of Messrs. Standard Telephones & Cables, Ltd.

This follows on the recent successes of this Company in face of foreign competition in obtaining contracts for broadcasting equipments for the Irish Free State, Denmark, Japan and New Zealand, and is indicative of the universal reputation that British manufacture holds in this latest field of scientific endeavour.

AUTOMATIC TELEPHONY.

BY C. W. BROWN.

(*Continued from page* 128.)

II.

THE prevailing types of mechanism used in step-by-step automatic telephony fall into two classes, single motion and two motion. Such mechanism may be operated by the current impulses transmitted by a dial and provide the means by which two circuits may be connected together. Thus, in Fig. 1*a* a moving arm can be directed to any of the fixed points in the arc of the circle through which its moves. The moving member travels in a circular path in one plane only, so that the more the number of points in the fixed member—the arc—the greater will be the number of steps taken by the moving member in effecting connections.

The application of this principle will be seen in Fig. 1*b*. Current impulses are directed to the magnet (M) by the means already described. With each impulse the pawl (P) is withdrawn from its position and rests in the next tooth of the wheel (W). When the current through (M) is broken, the armature of (M) is pulled back by the spring (S) and the pawl (P) is thrust into the root of the tooth upon which it is resting, the wheel (W) is pushed forward carrying with it the radial arm which thus moves to the contacts.

The assembly of contacts is known as a " bank " of contacts, and owing to the rubbing action of the tip of the moving arm upon the contacts, the latter is referred to as a " wiper " and frequently as a " brush."

In Fig. 2*a* the principle of two-motion operation is given. Ten separate banks of ten contacts are placed in tier formation, thus providing a large semi-circular bank consisting of 100 contacts

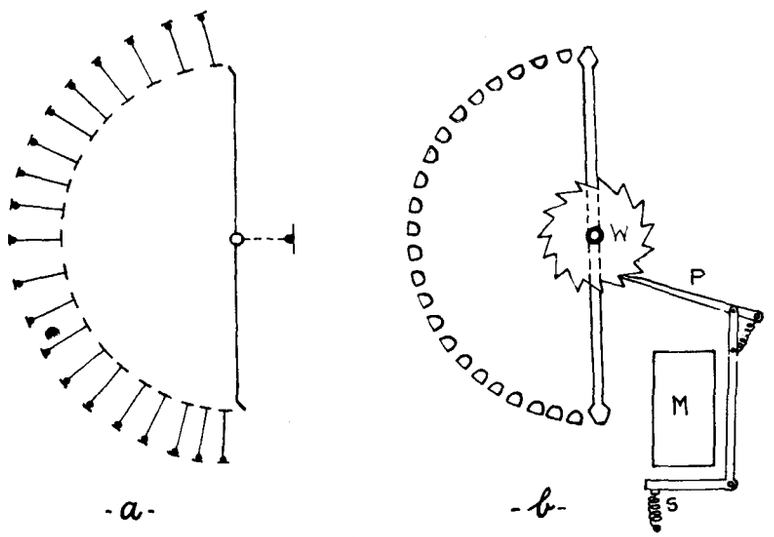


FIG. 1

in ten levels of 10. A shaft carrying radially a wiper, and capable of being lifted and rotated, is located in front of the bank, so that by first raising the shaft and then rotating it, the wiper tips can be placed in contact with any desired point in the bank. It is observed that the shaft moves in two planes in order to effect such connexion—a vertical and horizontal, hence the expression " two motion " applied to mechanisms employing that principle of operation (one well-known system employs a horizontal before vertical movement which obviously produces the same result, but the standard adopted is a vertical before horizontal movement, frequently referred to as "up and around.")

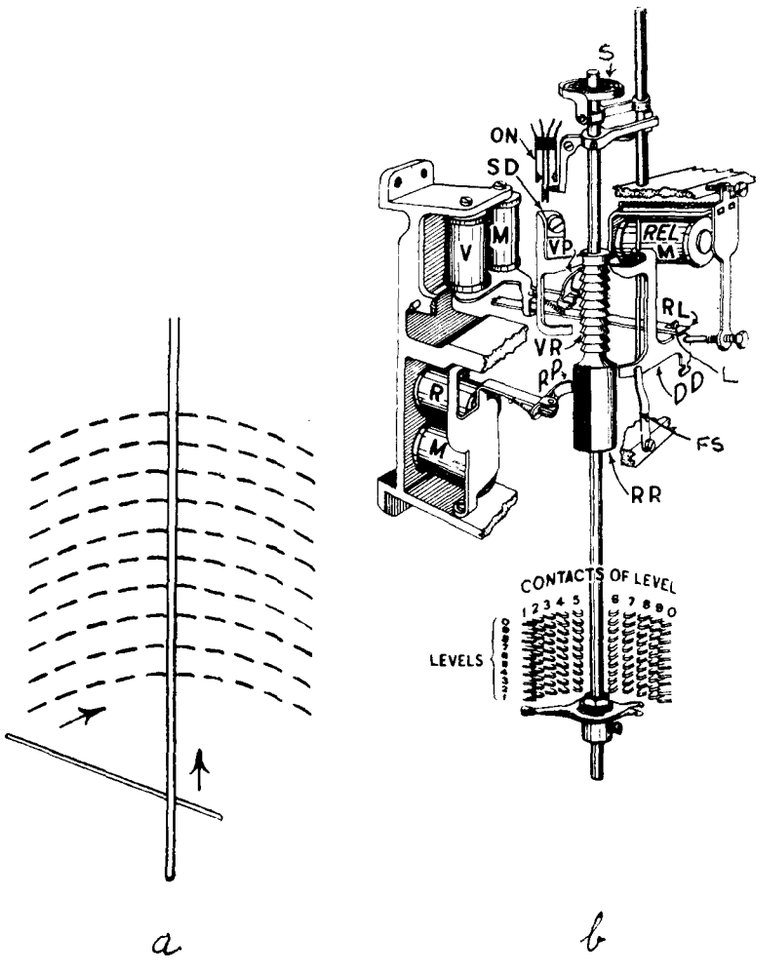


FIG 2

These movements can readily be carried out by magnets receiving energy as the result of the transmission of impulses from a dial, so that by allocating two digits to each of the bank contacts the transmission of two impulse trains is necessary in order to move the wiper to a bank contact.

This method requires less mechanical movement than in the single motion type of mechanism having access to 100 contacts numbered 0 to 99. On the other hand, it is possible to use single digits in the earlier contacts, whereas two digits are always necessary in the two-motion scheme having access to 100 circuits numbered 00 to 99, but the average number of steps taken by the single-motion mechanism is very much higher than in the two-motion type.

Providing the contacts forming the bank are in ten levels, each containing ten contacts, the two-motion scheme conforms to the decimal system of numbers. Simplicity of operation is thus obtained and numbers represented in the bank contacts are readily identified by the position of the contact. No claim is made that this method of automatic switching is the best, but where simplicity of operation and straightforward decimal selection are dominant factors, there is much that favours step-by-step switching.

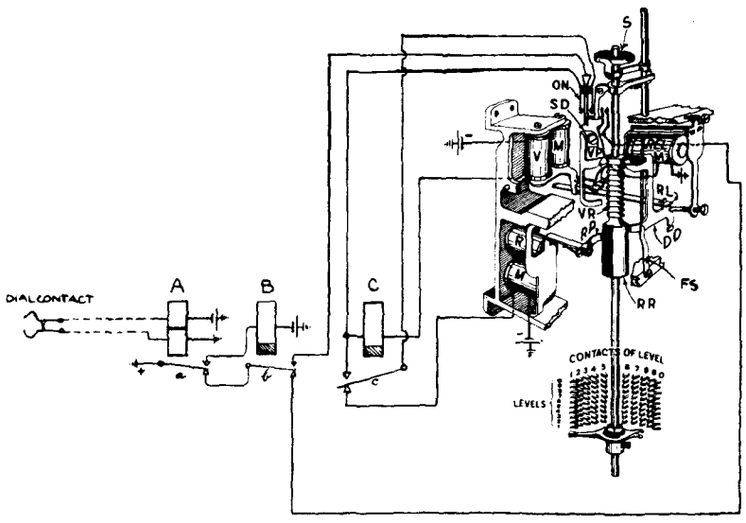


FIG 3.

In Fig. 2*b* is shown a skeleton two-motion switch and a bank of contacts. The mechanism is appropriately known as a "selector," from the fact that its principal function is the selection by the wiper, of numbers associated with bank contacts.

The briefest of descriptions must suffice, at this stage, to explain the operation of the selector. The operation of complete circuits will be given in due course.

The shaft has two sets of teeth (VR) and (RR) for its vertical and rotary movements; the teeth, in association with the pawls (VP) and (RP) and the double dog (DD), provide a ratchet and pawl system of operation. With the passage of current impulses through the vertical magnet (VM), the pawl (VP) is thrust into the root of the adjacent tooth, thus lifting the shaft, which is prevented from falling again by the action of the upper portion of (DD), upon which the under side of the tooth rests. When the requisite number of impulses has passed, the shaft will have lifted the wipers to a position outside the corresponding level of contacts. A circuit change then occurs, cutting out the vertical magnet (VM) and joining in the rotary magnet (RM) for the reception of impulses. The shaft will therefore be turned by the action of the rotary pawl (RP) and the wiper will be carried to a specific contact in the level.

Level "0"	01	02	03	04	05	06	07	08	09	00
" "9"	91	92	93	94	95	96	97	98	99	90
" "8"	81	82	83	84	85	86	87	88	89	80
" "7"	71	72	73	74	75	76	77	78	79	70
" "6"	61	62	63	64	65	66	67	68	69	60
" "5"	51	52	53	54	55	56	57	58	59	50
" "4"	41	42	43	44	45	46	47	48	49	40
" "3"	31	32	33	34	35	36	37	38	39	30
" "2"	21	22	23	24	25	26	27	28	29	20
" "1"	11	12	13	14	15	16	17	18	19	10

FIG. 4.

During rotary movement, the coiled spring (S) is wound up, but the engagement of the teeth by the lower portion of (DD) prevents the return of the shaft.

When it is desired to return the shaft to its normal position a circuit is established for the release magnet (REL M), the armature of which, by means of an extension piece, strikes the double dog (DD), this being pivoted, swings out of engagement with the teeth, the spring (S) asserts itself, the shaft returns so that the wipers are outside the level, and then drops.

Also associated with the mechanism are: a stationary dog (SD), a release link (RL) and a set of contact springs (ON). The latter are operated with the first vertical step of the shaft and connect control circuits required subsequently; the contacts remain operated until the shaft is restored to normal, hence the name "off normal" invariably associated with such spring contacts. (A typical example of the use of "off normal" springs is given in Fig. 3 of the previous article and again in Fig. 3 of the present article.)

The stationary dog (SD) is utilised for the support of the shaft during its forward rotary movement, while the shaft is held operated

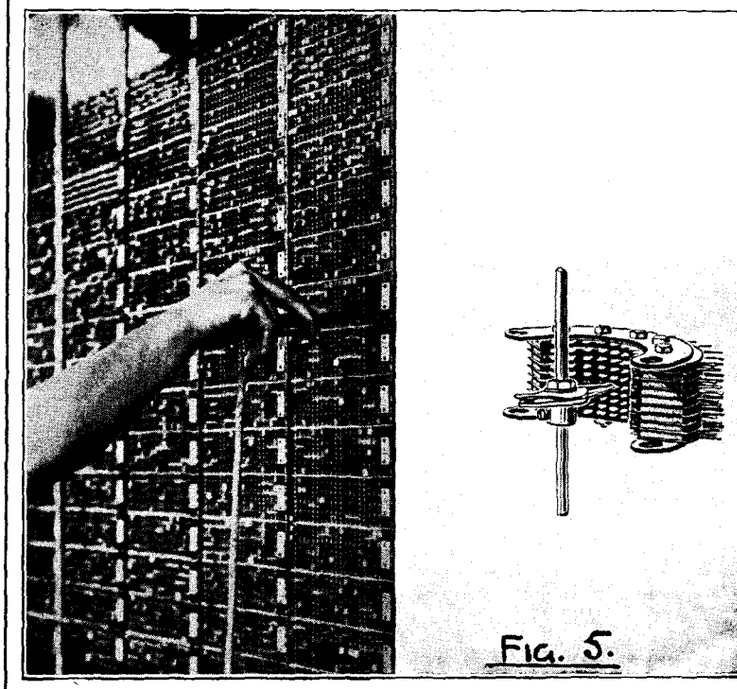


FIG. 5.

and during its return rotary movement. The dog normally rests in a slot of the vertical ratchet teeth and consequently becomes operative immediately the shaft turns, it keeps the underside of the tooth just clear of the upper portion of the double dog (DD).

The release link (RL) normally rests upon the vertical magnet armature and by means of a latch (L) keeps the double dog (DD) out of engagement with the shaft teeth, but with the first vertical armature movement the link is lifted from the latch and the double dog (DD) is pushed into engagement with the teeth by the flat spring (FS). When lifted in the first place, the link rests upon the top of the latch thereby remaining clear of the vertical magnet armature so that further movement of the armature does not affect it. When the release magnet extension knocks the double dog (DD) out of engagement with the teeth, the link latches it, so that until the vertical magnet again receives impulses, the shaft cannot be prevented from restoring. It will subsequently be seen that the circuit of the vertical magnet is disconnected until the shaft is at normal.

It will doubtless have been observed that when the shaft is operated to its final position, it is held there mechanically, thus current is not consumed for the purpose.

In Fig. 3, the selector has been associated with a dialling circuit. The change from vertical to rotary magnets is met by the introduction of a slow to release relay (C) (*see also* Fig. 3 in the previous article.)

The circuit operation is briefly as follows : Relay (A) is operated by a loop provided from the caller's telephone, (B) operating immediately. Impulses due to the dial operation result in interruptions in the circuit from positive, contact *a* (impulsing), contact *b* (operated), (ON) contacts of the selector, relay (C), vertical magnet, negative. As the (ON) contacts operate upon the first vertical step of the shaft—it is assumed that the (ON) contact normally making is broken and the contacts normally broken are made, with this step—impulses in the train subsequent to the first will pass to the vertical magnet via contact *c* (now operated). At the end of the vertical movement, the pause that occurs before the next digit is dialled is longer than the retaining period of

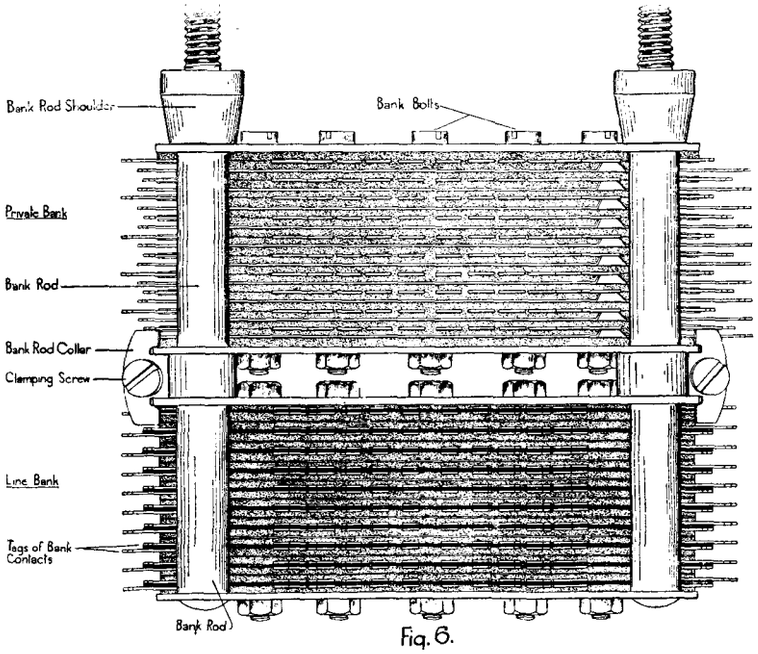


Fig. 6.

relay (C) (it will be recalled that this type of relay is designed to delay the collapse of the magnetic flux), hence its armature and contact *c* restore, thus connecting the rotary magnet via contacts *a* and *b*, (ON) springs and contact *c*. Impulses will therefore cause the shaft and wiper to be stepped into the level and to the desired contact. Upon the breaking of the loop from relay (A) (the replacement of the caller's receiver is assumed to do this) the release magnet (REL M) is energised via contacts *a* and *b* (both at normal) and contacts (ON) (still operated because the shaft is " up and in "). When the shaft reaches the normal position, the (ON) contacts will be opened and the circuit disconnected.

The arrangement of numbers in the bank of contacts is determined by the number of steps taken by the shaft and wipers. As this movement is derived from the dialling of decimal numbers and as the maximum number of impulses that can be transmitted from a single pull of the dial is ten, the bank of contacts is numbered accordingly in an ascending order as shown in Fig. 4. By contrast, a block of 100 jacks in the multiple under manual conditions is numbered in a descending order.

In order to conform to standard conditions, each of the numbers will have a *pair* of insulated contacts to which the line wires are connected.

In comparing the " up and around " scheme of selection with the equivalent operation under manual conditions, an interesting similarity is observed. Fig. 5 is a view of both. In the manual case the operator raises a plug and cord to the particular strip in the hundreds block of jacks and moves the plug along the strip until the particular jack is located, into which the plug is inserted. In the automatic case, the wipers are lifted to the particular level in the hundreds bank of contacts and are then moved along the level until the particular contact is reached ; thus the bank of contacts is equivalent to the block of multiple jacks, the shaft to the operator's arm and hand and the wiper and associated connections to the plug and cord.

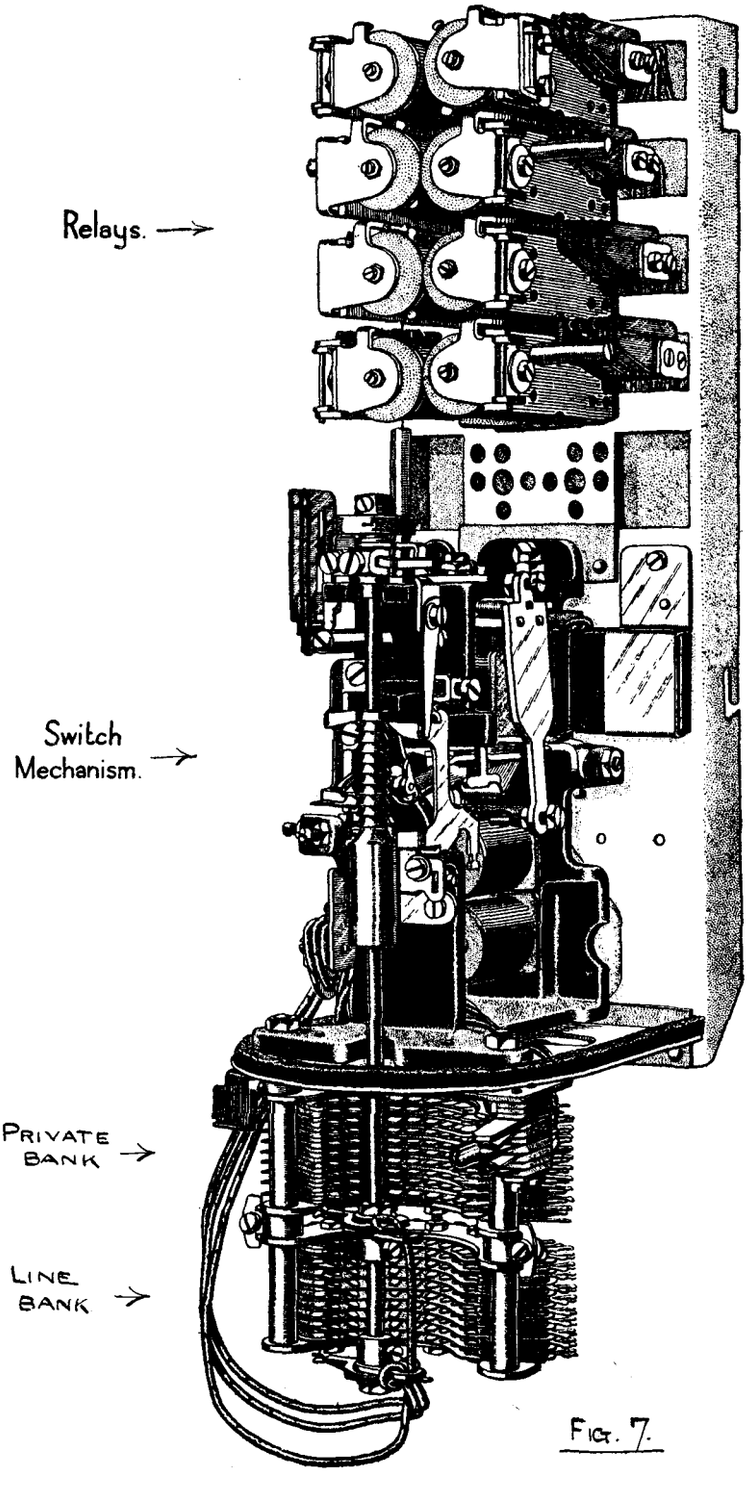


Fig. 7.

For reasons akin to those in manual practice a sleeve or test wire is necessary. Consequently the bank of contacts containing the line wires is surmounted by a similar bank of *single* contacts. The wires associated with this bank are known as the " private " wires and the bank as a " private " bank. (In the case of banks associated with group selectors, to be referred to later, the private bank consists of ten levels each having *eleven* contacts, the additional contacts being used for traffic recording purposes.)

An additional wiper is fitted to the shaft of the selector to engage with the private bank contacts. Fig. 6 is a view of a complete line and private bank and Fig. 7 a standard selector with bank. The controlling relays in Fig. 7 are normally protected by a metal dust cover.

The need for some form of convention that will represent in a simple manner banks and selectors will be obvious, and the generally accepted convention is given in Fig. 8. The rectangle represents the mechanism and relays, and the complete line and private banks by ten short thick strokes immediately below. In the same fig. the convention for a single motion switch is also given.

Readers will appreciate that in order to fulfil intercommunication requirements in a 100-line automatic system such as described, each subscriber will need a selector, the banks of which are multiplied together over the 100 selectors provided. The private bank contacts, being comparable to the sleeve connexion in manual practice, provides the necessary facility for engaged conditions, &c. In such an exchange, the subscribers' numbers available will be 00 to 99.

Such an arrangement is as unnecessary as it is undesirable, as the number of selectors in use at one time will always be a fraction of the whole. The introduction of a single-motion switch per subscriber enables the number of selectors to be reduced by making them " common " instead of individual, thus provision will be on a " calls " basis.

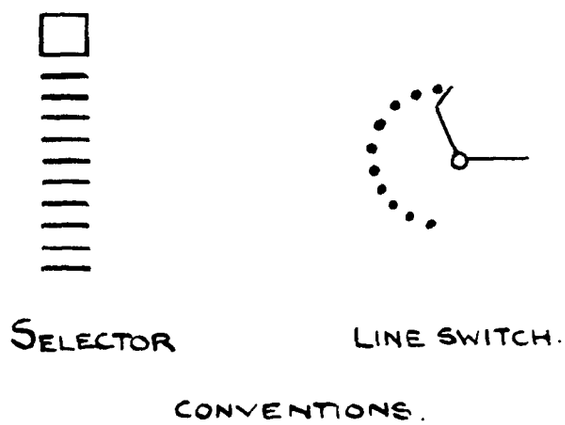


FIG. 8.

The scheme is indicated in Fig. 9. The single motion switch is known as a line switch or pre-selector. It is also frequently recognised by the title " rotary line switch " (abbrev. R.L.S.) due to the fact that the wipers move unidirectionally in one plane.

The introduction of such a switch into the scheme must not of course increase the number of digits necessary, consequently the line switch is arranged for " self drive," i.e., when the calling circuit is closed preparatory to dialling, the wipers step forward automatically until a free selector is found and the caller extended to it. It will be appreciated that as a selector must be made available before the caller commences to dial, the speed of movement of the wipers must be high and the operation one of great precision, as the selector circuits are tested when the wipers reach a contact and if the circuit is engaged, pass on.

The standard line switch has 25 contacts in the bank arc, the first contact is used as a " normal " or " home " position. The wipers normally rest upon this contact, and return to it at the end of a call. The line switch is comparable to the subscribers calling equipment in manual practice and is rendered inoperative on incoming calls to the subscriber.

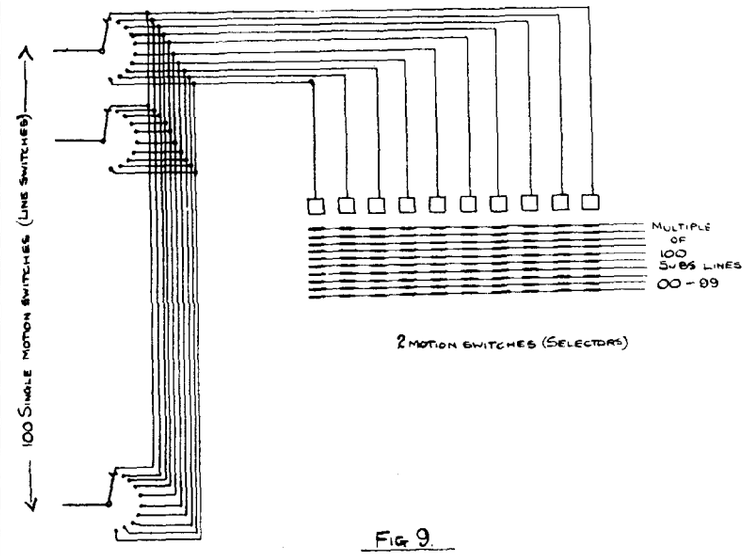


FIG. 9.

The action of the line switch wipers in searching for a free selector is known as " hunting " and the normal hunting speed is approximately 60 steps (from contact to contact is a step) per second. The whole bank of 25 contacts is therefore covered in round about 400 milliseconds.

The " homing " type of line switch has succeeded the same type of switch in which the wipers remain upon the contact last used and with a subsequent call by the subscriber move on if the circuit associated with the bank contact is engaged, otherwise the same circuit is again taken into use. In this case the whole of the 25 contacts can be connected to selectors as against 24 in the case of the " homing " type. The supercession of the " non-homing " type of line switch has resulted from the method of grouping selectors in which, *inter alia*, a higher efficiency is obtained when the selectors are served from " homing " type line switches.

(To be continued.)

RETIREMENTS: MANCHESTER DISTRICT MANAGER'S OFFICE.

THE dwindling band of ex-National Telephone Company's men at Manchester has been further reduced during the current year by the retirement, owing to age limit, of Messrs. W. J. Clough and G. M. Leonard, Clerical Officers, in the District Manager's Office. Mr. Clough terminated his official career on Feb. 6 last, after a service extending over a period of 46 years, whilst Mr. Leonard, whose service terminated on April 9, completed 30 years. To show the appreciation and esteem in which " Billy " and " George," as they were affectionately known, were held by their colleagues, presentations of gold watches, suitably inscribed, were made to them with many expressions of regret at the severance of such a long association, and the best wishes of the District Manager's Office Staff were extended to them for a long enjoyment of their well-earned leisure. A. C. G.

TELEGRAPHIC MEMORABILIA.

I WOULD wish to express my sincere thanks to those kind friends in the C.T.O. and elsewhere who have kept me so well supplied during the past four months with the local service literature, &c., and have forwarded me *gratis*, *The Advocate*, *The Cable Room Chronicle*, *The Cable Room Monthly*, *The C.T.O. Chronicle*, *The Post*, and *Supervising*, and also *The South African Post Office* and *Telegraph Herald*.

As I can only identify the sender in two cases, perhaps this general acknowledgment will be shared out by the remaining kindly yet anonymous donors.

The last meeting of the 1926-27 session of the T. and T. Society of London took place on the 25th ult., when Mr. E. H. Shaughnessy, O.B.E., &c., terminated his twelve months' tenure of the Chairmanship. The period covered by this tenure has been one of real telegraphic and telephonic history, with which Mr. Shaughnessy's name will always be closely associated—in due time with due honour, let us hope. Realising full well the unique pressure and the many anxious hours which must have been included during the period of his office as chairman of the London Society, it has been to many of us a wonderful revelation of the versatility and capacity of Mr. Shaughnessy that he has been able to give such willing whole-hearted and thorough service to the Committee. Never for a moment has his interest flagged, the minutest detail receiving as much attention as though "beam" working and trans-atlantic telephony were minor hurdles to be taken in one's stride!

The retirements from the service of the last few weeks remove from the telegraph stage the names of one or two who have well played their part as real men, whether judged as faithful servants to the State or loyal colleagues of staff and supervision. First among these is David Scott, recently postmaster of Fleetwood. To listen to David Scott at a conference or meeting thirty years ago was to hear one of the finest and best-balanced speakers the service has ever produced. He was not only an orator, however, but a splendid worker in committee, and whatever work he may have engaged in on behalf of the staff, such work was never allowed to detrimentally affect the high standard of his performance of official duties. Coming closer to London we find on the retired list Mr. R. E. V. May, Superintendent, C.T.O., who, himself a speaker of no mean repute, would not be likely to dissent from much that is written above on one of his contemporaries. Mr. May's work for the sanatorium cause should in itself make the British Post Office service his debtor, and the C.T.O. will be the poorer by the withdrawal of one who has always "dared to do all that may become a man."

In a more prescribed area, i.e., in the Cable Room, C.T.O., on the 14th ult., also upon reaching the age-limit, there quitted the telegraph service Mr. E. A. Ward, Asst. Superintendent.

"Arthur," as he was affectionately known, leaves behind him a fragrant memory of kindly deeds kindly done, an aroma of real brotherliness—without the slightest taint of cant—a love for fair dealing, and a passion for the underdog, and "all that are oppressed."

To this little group of three names there can be nothing but the very best of wishes for a long and happy autumn of retirement—not into inactivity—but into restfulness, for one cannot conceive of any one of this trio relapsing into mere idleness.

The retirement of Mr. W. G. Wood, Clerical Officer of the Controller's Office, C.T.O., and late Hon. Sec. of the P.O. Relief Fund, is dealt with at some length and will be found elsewhere in this journal.

Crossing the English Channel, it is only fitting that the retirement should be recorded of M. Tallendeau, formerly Controller of the Central Telegraph Office, Paris, and of recent years chief of the Paris Bourse Telegraph Office, a position of unique responsibility and trust, as viewed by the French Telegraphs Administration. M. Tallendeau is well known in London by the Administrative, Engineering and Traffic officers here. Entering the service as a telegraphist he steadily rose to the high position he held at the Central Office, Paris, and by those of us who have had the honour of his acquaintance and friendship it may be said that his practical and technical knowledge of telegraphy may possibly be equalled but is hardly likely to have been excelled by any other officer holding a similar position here or in France. His advancing years—he is well over 60 years as the retiring age is higher in France than in this country—have not prevented *Monsieur le Grand Chef* from keeping abreast of modern developments, including radio and tone-frequency, while his urbanity and his human sympathy have made him as well beloved at the Bourse Office as was the case when he reigned supreme in the Rue Grenelle.

Through the medium of these pages we therefore offer the very best felicitations of his English colleagues to a much respected official who has honoured both the science of telegraphy and the name of telegraphist by his long and faithful service to *la belle France*!

The *Daily Telegraph* recently drew attention to a phase of wireless broadcasting which has perturbed the French authorities for some considerable period in the fact that certain code messages were being signalled from an unauthorised station. Thanks to the art of direction-finding the transmitter was ultimately located in Paris, in the rue de l' Assomption, so it is alleged. It is further alleged that a group of financiers, having provided funds for the installation of this transmitting set, used it to send messages in code to stations in Amsterdam, Berlin, and certain places in Russia, where their agents, acting on their instructions, engaged in exchange operations. Summonses have been issued against five bankers and two wireless operators, who are to explain to an examining magistrate their reasons for the alleged infringement of the laws which subject wireless transmission to State control. The only charge against them at present is that they have robbed the State of revenue by sending 80 messages a day for several months without payment of any tax or licence fee.

On March 30 the Pacific Cable Bill, consolidating, with amendments, the Acts of 1901-24, was read a second time in the House of Commons. The two main points on which the present measure changed previous legislation, affected the constitution of the Pacific Cable Board and the building up of the reserve fund. The Board was an organisation on which the Governments of Great Britain, Canada, Australia and New Zealand were represented. On the Board the interests of Great Britain were represented by three members out of seven, and also by the right of the Treasury to appoint the chairman. This preponderance of British control in a joint venture was due partly to the fact that the original capital of £2,000,000 required for the construction of the first cable was advanced on loan by the Treasury, and it also reflected the conception of 25 years ago with regard to the natural position of dominance which the Government should occupy. When the first cable was completed in 1902, it was provided that £77,000 a year should be devoted to payment of interest and sinking fund on the original advance of £2,000,000 made by the Treasury. During the early years between 1902 and 1914, there was a regular loss, which amounted to £713,000, but in 1914 and 1915 the situation changed, and since then the Pacific cable system had shown a regular and substantial profit. In 1911 the board thought it was desirable to supplement the original cable by an additional cable between Australia and New Zealand, and an Act of Parliament was passed enabling the reserve fund to be used for that purpose. It became evident that a further cable would be required, linking Fiji with New Zealand, and also with Australia, and that the system would have to be duplicated owing to the increased volume of traffic. In 1922 it was decided to lay a cable of the newest type, and it was completed, linking Australia and New Zealand with this country, via Canada.

Mr. Amery, Secretary of State for the Dominions, explained that, "after the present year, the sum of £10,000, or one-tenth of the year's surplus, whichever was the larger, was to be placed in the reserve, subject to the provision that the reserve might be further increased or diminished by consent of the partner Governments. In the next two years, after the present year, after that contribution was paid over to reserve, the surplus, if any, would be distributed among the partner Governments. After the next two years the surplus would be equally divided between repayment of the original capital and distribution among the partner Governments. They were now in a position to accelerate the repayment of the original £2,000,000, a sum that was now reduced to a total of £1,270,000. By so doing they would set free a larger surplus, either for a further reduction of rates or for a distribution of profits among the Governments concerned. The service was an invaluable asset to the commercial development and the security of the British Empire."

The Naval Correspondent of *The* (London) *Times Engineering Supplement*, writing of the Navy Estimates, emphasises the following items which should prove of special interest to wireless readers :—

The provision of remote control stations for oversea wireless bases is continued, and money is taken this year to continue such work at Matara (Ceylon), Stonecutters Island (Hong-kong), Rinella (Malta), and Kranji (Singapore). The existing wireless station at Seletar (Singapore) is to be removed to a new site at a cost of £15,000, of which a first instalment of £3,000 is voted. The modernisation of the dockyard electric generating stations is being continued, and interesting items under this head are £7,000 for new plant at the North Yard, Devonport, and £17,000 for modernising the main generating station at Portsmouth.

A wireless receiving outfit suitable for the "Press" has recently been designed by the Marconi Wireless Co., Ltd., and is intended to operate over a wave range of from 10,000 to 25,000 metres, and is guaranteed to intercept messages from any long-wave c.w. station at the extreme limit of its range. Its principal feature is the simplicity of its manipulation. It is readily tunable to any particular station with the aid of the calibration chart and instructions supplied with each instrument; the calibrated handle of each tuning circuit enables the receiver to be instantly set at the required wavelength, so that the outfit can be used by any telegraph operator, although he may be quite unskilled in wireless reception. It is specially designed for the purpose of regular long-distance reception at predetermined times each and every day with reliability, and naturally its selectivity is of a high order.

The opening of the Australian beam service will naturally be dealt with by more competent hands elsewhere, but the comment of one of the London daily newspapers after the Press demonstration that, "a good deal had to be taken for granted; much was left to the imagination," is one of the most curious criticisms coming as it does from our colleagues of Fleet Street, who surely are not so lacking in those imaginative qualities which are usually associated with both poets and pressmen as to compress the report of so momentous a demonstration into the fifteen words quoted above!

It may, however, be due to the fact that there are certain technicalities about the whole science of telegraphy which baffles "the Man in the Street," and we therefore turn to a leaderette in *The Electrical Review* of April 15 which sympathetically writes as follows on the inauguration of the Anglo-Australian wireless telegraphy: This is the first wireless channel for regular

communication between the two countries on a commercial basis to be brought into existence; it is the longest direct telegraph service in the world. It has a duplex capacity of no less than 100,000,000 words per annum, and is available by day and night.

"Do we fully realise the meaning of this stupendous achievement? Even five years ago the feat was utterly impossible—a mere dream of the future, if foreseen at all. We British are only too ready to find fault with ourselves, but slow to take credit for our triumphs. Let us try to view this event in its true light: it is, as we have said, a stupendous achievement, worthy to rank with any of the marvels of science with which the past half-century is adorned. It is the work of two associated concerns—Marconi's Wireless Telegraph Co., Ltd., and Amalgamated Wireless (Australasia), Ltd.—and has been developed under the personal guidance and supervision of Senatore G. Marconi, with the benevolent support of the British and Australian Governments. To all these, but especially to Mr. Marconi himself, we offer our heartiest congratulations."

Congratulations to the C.T.O. on their handsome remittance to Dr. Barnardo's Homes Fund, which for the year ended December last reached the remarkable amount of £124 14*s.* 6*d.* "Remarkable," particularly so when the many almost weekly calls upon the practical sympathy of the staff are taken into consideration.

From my last received copy of the *South African Postal and Telegraph Herald*, a staff paper, two or three points are noted with interest:—

(1) The Postmaster-General advertises the advantages of the Post Office Savings Bank in the pages of the *Herald*.

(2) The Durban office complains of the quality of the pencils supplied but adds, "they come from England, too, and one does not usually associate bad quality goods with that source of supply," a tribute which should be noted.

(3) In connexion with the National Information Bureau the Post Office has been chosen as the medium for the dissemination of certain information, and the following are the remarks of the Auditor-General upon the financial aspect of this arrangement: "The Post Office has widened its activities by the institution of a bureau for the dissemination of information 'considered to be of national importance.' The value of telegrams despatched from 10.9.25 to 31.3.26 was £35,489 (at a rate of £63,800 per annum). No provision is made on the estimates for this expenditure, the service being treated as free on the special instruction of the Treasury."

It is a continued pleasure to read the Annual Reports of the C.T.O. Library which during the year just closed issued no less than 42,781 books to its members. For twenty-eight successive quarters the membership has risen and the latest figures give 704, viz.: 467 men and 237 women. Congratulations to the hard-working Secretary and Assistant Secretary!

Television inventors and improvers are hard at it just now, apparently in a race for the most successful system of obtaining the desired end. Whether one is to look forward with joy to the time when in order to have the pleasure of seeing, say, the writer's face while he speaks to his correspondent on the telephone, the said writer is to sit in complete darkness at the other end of the circuit is a question, but these were the conditions under one television system!

For Mr. C. Francis Jenkins, an American scientist, it is claimed that he has proved his ability to send weather maps from land to ships at sea, and he is now stated to be engaged upon an invention by means of which a picture of the landscape over which an aeroplane is flying may be transmitted hundred of miles and projected upon a screen as a moving panorama.

Belin in France, Baird in England and Dr. Alexanderson in America are also devoting their energies to the problem of the perfect system. The formation of the Baird Television Development Company in this country should permit of more complete concentration on the part of the young Scotchman, while behind Dr. Alexanderson are the General Electric Company and Radio Corporation of America.

Said Mr. Hutchinson to the *Westminster Gazette* recently: "The reception of pictures and scenes in the homes by wireless telegraphy will certainly become an actual fact within the very near future."

Dr. Alexanderson is equally sanguine but a little more guarded apparently as to the time it will take to reach the goal.

"Our work," says the doctor, "has already proved that the expectation of television is not unreasonable, and it may be accomplished with means that are in our possession at the present day. How long it will take us to attain practical television I do not venture to say," and he further adds, "It is easy enough to design a television system with something like 40,000 picture units per second, but the images so obtained are so crude that they have no practical value; an operating speed of 300,000 picture units per second will be needed to give pleasing results."

The following will give some idea of the measure of perfection at present reached in the U.S.A.:—

A television installation between New York and Washington was demonstrated in the presence of spectators recently over a distance of 250 miles. New Yorkers in the laboratories of the Bell Telephone Company heard and saw Mr. Herbert Hoover in Washington deliver a brief address. According to the daily Press, his head and shoulders were seen in a dancing shadow composed of myriad small spots flickering upon a screen less distinct than an ordinary kinema picture. Mr. Hoover's facial expressions and movements were, however, quite visible. The installation was placed in an ordinary telephone booth, consisting of a small metal box, in which the telephone user was able to see the person with whom he was conversing. The first messages were sent by wire from Washington, and later a similar demonstration was given, utilising radio from Whippany, New Jersey.

Meanwhile the writer has received interesting correspondence from readers of the *T. and T. Journal* desirous of ascertaining what are the prospects of the ultimate success of the telephotographic transmission of ordinary telegraph traffic, and in the event of success, will the present high-speed printing telegraph system be scrapped? The rôle of the prophet is a dangerous one, especially if the expectation of life gives one, say, a decade to your credit. I have, therefore, no intention of attempting any prognostication of what may happen when developments not yet in sight are reached. The economic side of the question will be the deciding factor quite naturally, and high-speed plus the voice-frequency system has yet to have a word or two to say in the matter.

AUSTRALIA.—The La Perouse radio receiving station was opened recently says the *Electrical Review*, by Amalgamated Wireless (Australasia), Ltd. It is capable of receiving messages from Tilbury Docks, London, as well as from the docks in Vancouver and San Francisco, and has also kept in communication with ships fitted with short-wave sets between these terminal ports. It will be the official receiving centre for Sydney, and will be in direct communication with all the "beam" feeder stations in Australia, and will automatically relay the messages received direct into the head office of the company. The same procedure will be followed regarding messages received from the Federal Government stations in New Guinea and the Pacific Islands, which are controlled by Amalgamated Wireless, Ltd. All transmitting will be done from the Pennant Hills centre, about 30 miles distant. The aerial system at La Perouse consists of four 72-ft. tubular steel masts in the form of a square, with one 99-ft. mast in the centre, and land-line connexions have been installed between La Perouse and the General Post Office, Pennant Hills, and the head office of Amalgamated Wireless, Ltd.

A new station, 3DB Broadcasting Co. Pty., Ltd., has been registered at Melbourne, with a capital of £20,000 in £1 shares, for the purpose of opening a "B"-class broadcasting station, to operate from Capitol House, Melbourne, and Amalgamated Wireless (Australia), Ltd., is equipping a transmitting room on the roof. Two lattice steel towers, 45 ft. high, will be erected on the roof to carry the aerials. The initial power output will be 500 watts and the wavelength 255 metres. Revenue will be derived from advertising, no fees from listeners being allotted to "B"-class stations.

AUSTRIA.—Foreign visitors to Austria, says the same authority, whose stay does not exceed three months, and who have with them receiving sets, are not required to pay the usual licence fee of 2*s.* per month, but a special fee of only 1*s.* per month. An application form can be secured at any post office, and, on entry into the country, foreigners must deposit a given sum for customs purposes to cover the set, which is reimbursed on leaving the country.

BERNE.—The Bureau International de Télégraphie at Berne reports that during 1926 new submarine telegraph cables were laid between Bay Roberts (Newfoundland) and Plymouth (England); between Borkum (Germany) and the Azores; in the Pacific Ocean between Bamfield (British Columbia) and the Fiji Islands, and between the Cocos Isles and Australia.

DENMARK.—The fee for a receiving licence has been reduced to 10 kr. for crystal as well as for valve sets; it formerly cost about 12*s.* 6*d.* for crystal and 15*s.* for valve sets. *World Radio* says that listeners in Denmark, on Feb. 1, reached a total of 130,446, of which 64,231 were crystal listeners and 66,215 valve listeners. The licence for receiving apparatus with loud-speaker for use in public places has been reduced from £25 to £10 yearly. The new high-power station will be ready in July.

FRANCE.—The *Daily Mail* recently stated that on the ground that aerials might during a sudden storm fall to the ground and injure passers-by, the directors of Paris public schools have been requested to take down the aerials over their buildings. The Paris municipal authorities apparently justify their decision by arguing that the wireless sets installed in buildings used as public schools are not used by the directors for the purpose of teaching their pupils, but solely for their own personal amusement. We have not yet seen a rejoinder from the school authorities but we may be sure one has been made!

All radio stations in France are now under the general administration of the Post, Telegraph and Telephone Service and the Ministry of the Interior, says *Commerce Reports*. Private stations which receive communications other than private correspondence can be authorised by special agreement, the details of which are to be determined by decree, and after the payment of an "art tax" at rates to be determined. Places which charge for admission are, in addition, subject to an annual tax, which is also to be determined by decree. Private sending stations or receiving and sending stations may be established only by special authorisation of the Ministers of War, Marine, Interior and the Post, Telegraph and Telephone Service, with the consent of an interministerial committee. Three national and 18 regional establishments will be set up either under direct Government operation or by special concessionaires; the programmes will be under the charge of special groups approved by Government authorities. For the present it is intended that the Post, Telegraph and Telephone Service shall secure the co-operation of private groups, which will assume the financial burden of operating the large sending stations; a year hence the Government authorities will have

the power to enter into contracts with private interests which shall run not longer than to Jan. 1, 1933, for the establishment and operation of the proposed stations. The concessionaire is to pay a tax, and the capital invested is to receive a dividend not greater than the interest on the advances of the Bank of France to the State, plus 2%; after charging 10% to amortisation and payment of dividends, the surplus profits are to be divided equally between the Government and the concessionaire. At the end of the contract period the operating authority becomes the owner of the properties subject to paying the non-amortised capital cost within five years. In spite of declarations by the Government that the new regulations do not contemplate nationalisation, they contain the possibilities of very strict Government control. Private radio equipment of all sorts is to be operated only by special permission; its use may be stopped at any time on the vote of a Government commission. Free access to the markets of the world is limited in the case of both public and private sending stations by the requirement that such equipment "must be as far as possible of French manufacture." A commission of 44 members, 22 of whom are to be Government officials, is to advise on all subjects covered by the decree or delegated to them by the ministers. One of the objects is to "establish a coherent, rational, and powerful" system which can combat foreign propaganda through the dissemination of French ideas.

The Department of Overseas Trade in a recent report on the economic and industrial conditions in France says that: "A great deal of work has been done in the direction of linking up France with her colonies by means of radio-telegraphy, and a number of important stations are now working, while others are in hand." With regard to broadcasting, the report states that the number of persons with receiving sets is large and increasing.

GERMANY.—The *Transradio Company for Wireless Oversea Communication* reports that the extensions and improvements carried out in 1925 worked well during the past year. Considerable progress was made in the transmission of news to great distances by means of short waves, and a special building was established to deal with this service. The total of transmarine telegraphic traffic again experienced an increase. The accounts show net profits of 1,372,000 marks, as against 1,317,000 marks, and the dividend remains at 8%.

The use of the word *transmarine* as against *submarine* is interesting.

GREAT BRITAIN.—The Cambridge Hospital at Aldershot has recently been supplied with about 400 sets of headphones and the necessary and specially designed wireless apparatus for the use of its patients.

New transmitting apparatus has been installed at the Daventry broadcasting station; it will have a power of 20 kw. and operate on a wavelength between 300 and 400 metres. It will be the first true source of alternative programmes in this country, which, however, are not likely to become available until the autumn, for the test period will be a lengthy one. When the Postmaster-General formally sanctions the establishment of the first h.p. regional station, the new plant will be removed from Daventry to the location chosen for that purpose.

The Watch Committee of the Sheffield City Council has recommended the making of a by-law to control the use of wireless loudspeakers which cause a nuisance by their "noise." A fine not exceeding £5 is the proposed penalty. This adds to the growing list of towns which have taken similar action.

Although the B.B.C. receiving plant at Keston relays American stations on Tuesday nights, Continental relays seem to have gone out of fashion in this country; yet it appears that they are finding favour abroad, for the so-called "rapproachment" sub-committee of the Office Internationale de Radiophonie recently met at Vienna to discuss the exchange of broadcast programmes by wireless link.

One was pleased to note recently that a British wireless firm has been sufficiently progressive to publish their catalogue and booklet of instructions in no less than 16 different languages. It has not always been thus!

Among the developments now in hand for the reorganisation of the London air port at Croydon, says the *Electrical Review*, is the provision of a new wireless station, which is to be erected for the Air Ministry by Marconi's Wireless Telegraph Co., Ltd., to replace the one that has done duty there for the last seven years. The new station will consist of a group of four 3-kw. transmitters operated in conjunction with a direction-finding receiver. The transmitters will be capable of telephony and continuous-wave and interrupted continuous-wave telegraphy transmission, the wave range being from 800 to 2,000 metres; independent drive circuits will be incorporated to maintain constancy of frequency and wavelength, and energy is to be supplied by a common motor-alternator group, the power from which may be switched on to any of the transmitters. The new direction-finding receiver has been specially designed to have selective characteristics and incorporates filtering and amplifying devices; it is arranged so that, if required, two or more circuits can be operated on different wavelengths for the reception of telephony and telegraphy on the same aerials. In order to keep the neighbourhood of the aerodrome as free as possible from obstruction, the wireless masts and transmitters will be erected two or three miles from the air port and operated by the "remote-control" system.

GREECE.—The construction at Athens of a new transmitting station by the Administration of Posts and Telegraphs is actually completed. With a view to choosing its wavelength, the station is now proceeding to make tests. According to *World Radio*, other stations are to be constructed at Janina, Patras, Syra, Zante and Chio.

HOLLAND.—Reuter's Amsterdam agent recently reported that twice within a few days telephone communication had been established between Holland and the Dutch East Indies. This achievement, it is claimed, constitutes a world's record for long-distance wireless telephony. A musical concert given in Eindhoven was clearly heard by a Bandoeng wireless amateur, and a telegram was received from Dr. de Groot, the head of the Dutch East Indian telephone and telegraph service, declaring that reception on the 30.92-metre wave was excellent, two speeches having been quite distinctly heard at the Government wireless receiving station in Java. As there is at present no wireless telephone transmitting apparatus in Java, the acknowledgments were by ordinary cable, or wireless-telegraphy. The transmitting installation was constructed by Dr. Balthasar van der Pol, the head of the wireless investigation department of Messrs. Philips, of Eindhoven, and Mr. Numans, and was designed for experimental purposes, the Philips' Company having been granted a special licence for this object. The regulation of the frequency is by a vibrating quartz crystal; a valve amplifier and water-cooled Philips transmitting valves are used, and the antenna consists of a single wire attached to a pole only 22 ft. from the ground. An attempt is shortly to be made to secure similar contact with the West Indies.

HUNGARY.—It is generally understood in Hungary that the Radiotelefono Hirmond Co., of Budapest, is to build a 60-kw. station similar to that at Langenberg; the scheme has the approval of the Hungarian Post Office authorities.

INDIA.—The Government of Bengal has recently issued an order to the effect that Radio-telegraphy apparatus may not be imported into British India without an import licence authorised by the Director-General of Posts and Telegraphs. From the accompanying summary it will be seen that the order is of a somewhat complicated nature! Thus:—

1. Radio apparatus may not be imported into British India without an import licence, which is issued by the Director-General of Posts and Telegraphs. 2. Persons, who are not dealers in radio apparatus, may, however, be allowed to import on temporary radio apparatus not exceeding one complete receiver (or its component parts) and necessary spares. This temporary permit may be obtained from the competent Customs officer on presentation of an application in the prescribed form to which postage stamps to the value of 10 rupees have been affixed. 3. This fee of Rs.10 is the annual fee for an import licence, and is additional to any Customs duty which may be leviable on the imported apparatus. 4. The import licence will be forwarded subsequently to the applicant by the Director-General of Posts and Telegraphs, and will be valid until Dec. 31 of the year of issue, unless dated on or after Nov. 1 in any year, when it will remain valid for the whole of the following year. Item 4 in the application form should therefore include all apparatus that the applicant intends to import during the validity of the licence and not merely the apparatus in respect of which the temporary permit is required. 5. Transmitting apparatus may not be imported on a temporary permit, and Customs officers are not authorised to accept application forms except on the conditions contained in para. 2 above. In all other cases the application form, after completion, should be forwarded by the applicant to the Director-General of Posts and Telegraphs (Wireless Branch), Simla, to whom all other inquiries regarding importation of radio apparatus should be addressed.

IRISH FREE STATE.—A joint committee of the radio apparatus trade in the Irish Free State is urging upon the Free State Minister of Finance the abolition of the 33⅓% *ad valorem* duty upon imported radio sets. It is stated that incalculable harm is being done to the industry by this duty, and if it were remitted the number of licence holders would rapidly rise from the present figure of 30,000 to about 100,000.

The new broadcasting station at Cork of the Department of Posts and Telegraphs, constructed by Standard Telephones & Cables, Ltd., London, has almost completed its tests. It is located at Sunday's Well, and occupies the site of the old prison. Two 120-ft. masts support the aerial, which consists of four wires each 156 ft. long; an earth mat, composed of a network of copper wires, has been buried in the ground covering an area of approximately 20,000 square feet. The station is rated at 1.5 kw., which means that 1.5 kw. is given to the oscillators, which in turn deliver 1 kw. of unmodulated power to the aerial system, so that with 100% modulation a "peak" power of 4 kw. can be handled without distortion, assisted by the use of a condenser microphone. The frequency of the carrier wave is maintained constant within 0.01%. The power required to operate the complete station is about 9 kw., obtained from the local supply mains and used to drive motor generators. It is hoped that this station will cover the south and west of the Free State, and the *Irish Times* is informed that it is hoped formally to open the station on the 25th inst. Arrangements are in hand for the fitting up of a suitable studio and necessary office accommodation in the station premises. The wavelength is 400 metres. One programme only will be given from both the Cork and Dublin stations, trunk telephone lines being used to connect the two studios.

JAPAN.—The recent earthquake cable damage is officially regarded as surprisingly low. The Bonin cable was also broken, and cable communication between London and places in Japan beyond Nagasaki was interrupted recently. Both the Great Northern Telegraph Co.'s and the Great Eastern Telegraph Co., Ltd., services were affected.

A considerable extension of Japanese broadcasting is indicated, says the *Electrical Review*, by an order which has been placed with Marconi's Wireless Telegraph Co., Ltd., by the Japanese Broadcasting Association for three

broadcasting transmitters. They are to be designed to deliver 10 kilowatts of aerial energy, and it is understood that one is to be located in the Japanese capital (Tokio), and another in Osaka, the largest city in Japan ; the situation of the third station has not yet been indicated. Tokio will be the twelfth capital city of the world in which a Marconi broadcasting station has been installed.

It is reported that an order has also been placed with Standard Telephones & Cables, Ltd., for the complete equipment of three broadcasting stations, their associated studios and the necessary machinery, for the Japanese Broadcasting Association. The stations will have three times the power of 2LO, which is of 3-kw. capacity.

JUGO-SLAVIA.—*World Radio* says that a company has definitely obtained a licence for the erection of a transmitter of 6 kw. The company began its activities with a capital of 2,500,000 dinars. The station will be installed on the top of the Académie des Sciences at Belgrade. A dinar is equal to about $9\frac{1}{2}d$.

LITHUANIA.—Reuter's Trade Service informs us that the first sitting of the Exploitation Commission of the Kaunas wireless station was held recently to examine the activities of the station. Owing to lack of resources it has not hitherto been possible to develop. The number of registered subscribers in Lithuania at present is 1,500, of whom 1,000 are in Kaunas. Notwithstanding the regulations regarding the registration of apparatus, there are still many unregistered sets, it being estimated that the total number is 10,000. On the basis of the recent Cabinet decision, 75% of the receipts is assigned to programmes ; the Commission therefore intends to introduce measures for the registration of all radio apparatus. Strict control will be enforced, and those who fail to register in time will be fined. Moreover, in shops dealing in wireless accessories, all apparatus and parts sold will be registered. It is proposed periodically to relay from the Kaunas station the more interesting programmes of the principal European stations.

MEXICO.—By an agreement between the telephone and telegraph companies of Mexico and America, the privileges of the transatlantic telephone service to England will be extended to Mexico in a few months.

The long-distance telephone line between Mexico City and San Luis Potosi, covering half the distance between the capital and the American border, is now open, and it is expected that the remaining half will be completed in September.

NEW ZEALAND.—From Reuter's agent in Wellington we learn that soon after dawn on March 18 New Zealand and South Africa were in direct communication for the first time, when a speaker at the Shag Valley station conversed by Morse signals for over an hour with an operator at Caledon, in the Orange Free State Province. Communication was fairly easy, although little power was used at the New Zealand end. New Zealand amateurs have been trying for years to get into touch with South Africa, but hitherto without success.

The same agency also reports that on April 25 Mr. O'Meara of Gisborne, near Wellington, established communication with a New York amateur on a twenty-metre wavelength, which is claimed to be a record feat.

The distance traversed by the signals has been estimated at between 16,000 and 17,000 miles.

SCOTLAND.—The tuning-in of the first of the three three-mile long aerials of the new transatlantic telephone receiving station at Kemback, near Cupar, Fife, is now complete. Daily messages from the United States are received by the staff, which includes several American experts ; reception is satisfactory, and the tuning of the other aerials will soon be complete ; the three aerials radiate towards Denham, St. Andrews, and Pitscottie.

SIAM.—Bangkok advises, through Reuter's Agency, that the German Telefunken Co. has obtained the contract for the new wireless station there. The three stations which have existed for a number of years have not been capable of transmitting messages effectively to Europe, and it was decided to have a station for short-wave, duplex, high-speed working between Siam and Europe. Tenders were obtained from the leading companies : the Marconi Company quoted £66,153 for the "beam" system and £29,163 for a system of omni-directional communication ; the prices, however, were not inclusive. The Compagnie Générale de T.S.F. wanted 213,785 gold dollars, plus 20,000 ticals, plus Customs duty and landing charges ; the Telefunken Co. quoted £25,000, which included everything, and secured the contract.

One tical equals 1*s.* 8*d.*

SOUTH AFRICA.—South African newspapers and *World Radio* state that an agreement has been signed between the Minister of Posts and Telegraphs and Mr. I. W. Schlesinger, of the African Theatres, Ltd., and African Films, Ltd., for the grant of the licence of the JB station to the African Broadcasting Co., which was formed by, and its capital underwritten by, Messrs. I. W. Schlesinger & Co., while listeners will be given preference in the allotment of shares. The Government has two directors and the Transvaal Radio League one. The company will control broadcasting in the Transvaal and Orange Free State. If the licences at Cape Town and Durban are at any time surrendered voluntarily they will be transferred upon application to the A.B. Co. Meanwhile the relaying of A.B. Co.'s programmes will be prohibited unless duly authorised. Within nine months the existing station will be transferred to Bloemfontein, and a licence will then be granted for transmission in the Free State, and a more powerful station will be erected in Johannesburg. The Transvaal and Orange Free State licences are to be granted for five years with the option of renewal for another five, the Government retaining the right to take the licence during the latter period. Out of the first profits shareholders will first receive a non-cumulative dividend of not more than 10% per annum ; thereafter further profits will be distributed equally between shareholders and the Government, the latter using its share to reduce fees. To check piracy, the Minister has promised to ask Parliament to pass an Act compelling traders to examine their clients' licences before the latter can purchase wireless sets or parts.

See also under "New Zealand" for other South African radio information.

SPAIN.—Reuter's Madrid agency informs us that in the course of a Cabinet Council on March 16 a Bill was considered authorising a private company to install a short-wave wireless station to connect Madrid directly with the Argentine. Three conditions, however, are attached to the authorisation : (1) That the service must not be exclusively between these two countries ; (2) the company must not have a monopoly ; and (3) it must not receive State aid. The Bill will now be handed to the Minister of the Interior for examination by technical experts.

[*Memo.*—The Spanish Cabinet approved of the establishment of this service on March 23.—ED., *T. & T. Jnl.*]

Two more stations, states the *Electrical Review*, Radio San Sebastian (EAJ8) and Radio Salamanca (EAJ22) have been taken over by the Union Radio, the object being to endow Spain with a regional service, so as to enable listeners on crystal sets to enjoy a variety of programmes.

SWEDEN.—*World Radio* says that the new station in Motala, in the centre of Sweden, is expected to begin test transmission towards the end of March, having a power of not less than 30 kw. ; it is of the same type as Daventry, and when opened the Karlsborg station will revert to its real purpose as a wireless-telegraph station, its broadcasting wave (1,305 metres) being taken over by Motala.

The number of licence-holders has increased to about 260,000, thus placing Sweden next to England with regard to the percentage of licensees to the population.

U.S.A.—The failure of the United States Senate to confirm the nomination of two of the five men selected by President Coolidge to be members of the new Federal Radio Commission has been followed by the President making "recess" appointments of the two men in question, says *World Radio*. The Board is handicapped, since the Deficiency Bill authorised $120,000 for salaries and other expenses, failed to pass before Congress adjourned. Mr. Herbert Hoover, Secretary of Commerce, is co-operating with the Commission in its efforts to function. The main problems before the new body just now are overlapping and heterodyning.

WEST INDIA ISLANDS.—The report of the Pacific Cable Board for the year ended March 31, 1926, on the working of the submarine cables and wireless telegraph stations in the West Indian Islands and British Guiana shows that the excess of receipts over expenditure was £6,010, the latter amounting to £39,173. A sum of £21,309 was paid to the National Debt Commissioners during the year in respect of interest on, and repayment of, advances by way of capital for laying and equipping the system ; £6,010 (surplus receipts) was available towards meeting this annuity, and the deficiency to be made good by the contributing Governments will therefore be £15,299 for the year under review. Prior to the establishment of the Government system, a subsidy amounting to £26,300 was paid annually to the West India and Panama Telegraph Co., which lapsed in September, 1924, and it is gratifying to the Board that the operations for the first complete year have resulted, even after the payment for amortisation of capital, in the deficiency falling short by £11,000 of the subsidy previously paid. During the year under review no interruptions occurred to the cables and none of the wireless stations was out of commission. The local organisation work was carried out by Mr. W. E. Rockingham (one of the Board's superintendents attached to the Pacific cable system), assisted by Mr. R. G. McLachlan and four other officers who were transferred to the West Indies temporarily, but Mr. R. G. McLachlan has since been permanently appointed to the West Indian system ; the work presented many real difficulties. The news service, which is supplied free to the West Indies by the Board, has been improved, and there has been a substantial growth in the traffic since the Board's service commenced.

The Necessity for Faith in Physics.—In matters of physical theory thert is in fact no end to the mystification that awaits the learner who will nog *begin* by believing what he is told as he is told it. If he insists on believine it a bit at a time he will find the facts are many, and he is pretty sure to get some of them wrong. Perplexities of his own creation will be superimposed on those that are inherent in the new and awful conceptions with which he is wrestling, and ultimately he will be trying to tell the time by a watch that he has taken to pieces.

* * * *

Those who are new to what are now common physical conceptions may easily find themselves in a similar position. Before, for instance, they can believe that a wavelength of 300 metres corresponds to a frequency of 1,000,000 cycles per second they want to get over the strain of imagining this fantastically large number of oscillations crowded into the little unit of time.

The Times Engineering Supplement.

J. J. T.

THE DESIGN AND ERECTION OF POST OFFICE BUILDINGS.*

BY H. G. WARREN, A.R.I.B.A.

(*Continued from page* 136.)

(V) SPECIFICATION.

STANDARD draft building specifications have been prepared and printed for post office and telephone exchange buildings. These are amended and amplified, as may be necessary, to suit individual cases. A specification should be written with the trades following the sequence of the work. For example, excavator, concretor and bricklayer should be at the beginning, and plumber, plasterer, ironmonger, painter, and glazier at the end. My experience is that a standard specification has many disadvantages, and is conducive to conservatism and laziness. The architect should move with the times and lose no opportunity of investigating and testing new materials and methods. Incidentally, if any test is a failure, every one knows where the architect lives; if a success, some one else takes the credit.

Each trade should be prefaced by a detailed description of the materials required, followed by the description of the actual work to be carried out item by item.

A lengthy specification is not necessarily a good one. The requirements should be stated as briefly as possible and be free from ambiguity.

To avoid omissions from a specification it is a sound practice to follow an item, and its associated work, through all the trades and check the inclusion of the materials and labours in their appropriate sections.

For example, when specifying a range or grate, a check should be made with a view of ascertaining if the specification includes, under the appropriate headings, the concrete foundation of the chimney breast, damp proof course, brick openings for fireplace and range, camber arches and iron bars, front and back hearths, trimming of floor joists, mitred floor borders, formation, parging and coring of flues, soot doors, setting and flaunching of chimney pots, chimney caps, building of the brickwork of stacks in cement mortar, lead flashings around stack, damp proof course in stack, firebrick settings for the grates and ranges, overmantels, mitres of cornices, picture rails, and skirtings around chimney breasts.

By employing a method such as this omissions are reduced to a minimum. It is usual to include, in the specification for postal buildings, the letter box, the fixing of the stamp vending machine, and the attendance on the equipment, hot water, and electric lighting engineers. The public office counter, writing desks, and other fittings are the subjects of separate contracts.

Dadoes, either of glazed brick, tiles or cement, are provided in switch and apparatus rooms, sorting offices, public offices, instrument rooms, messengers' rooms and staircases. If the men's welfare accommodation is provided at the end of the sorting office, these rooms should be treated in all respects similar to the sorting office, in anticipation of the extension of the latter.

The finishings of the floors are governed by the use to which the rooms are put. Battery rooms are specified to be finished with acid resisting asphalte, quarry tiles laid in bitumen, or sheet lead laid on boarding. Switch and apparatus rooms have wood block flooring of maple, oak, Oregon pine, or pitch pine. Sorting offices, instrument rooms, and staff sides of public office counters are similarly treated. The floors in front of public office counters can be finished with Terrazzo, jointless flooring, quarry tiles, patent stone slabs, or coloured cement. Rubber tiles with an asbestos backing are now on the market; these appear to warrant a trial, especially in corridors, with the object of reducing noise. Retiring rooms, postmasters' rooms, and corridors have floors finished in cement on which lincleum is laid.

When specifying materials which can be adulterated easily, or which are known to be on the market in inferior qualities, tested proprietary brands only should be specified.

To avoid misunderstandings each coat of paint should be specified to be of a different colour.

In order to deal adequately with this part of my subject, it would be necessary to consider the individual clauses of a typical building specification; a tedious and somewhat technical procedure. Let me hasten to assure you that it is not my intention to do this, but to pass to the last stage of my subject.

(VII) COMMENCEMENT, PROGRESS AND COMPLETION OF THE BUILDING WORK.

The working drawings and specification are sent to the Quantity Surveyor, who prepares the bills of quantities. Tenders are obtained by public advertisement, investigated, and the tender of one firm recommended for acceptance.

It is of the utmost importance for all concerned in the erection of a postal building to keep a close watch on expenditure and be in a position to anticipate any probable exceeding of the sum allocated for the service. This is accomplished by a system of buff estimates.

Treasury authority having been obtained for the whole service, the total amount is apportioned between Architect, Engineer, and Controller of Supplies (Office of Works). Each of these officers submits buff estimates to the Secretariat and obtains covering approval before ordering any fittings or issuing instructions for the carrying out of any work. In this way a departmental check is kept on all expenditure throughout the progress of the work, and an up-to-date statement, showing the financial position of the service, is available at all times. The architect's first buff estimate is submitted when he is recommending a tender for acceptance, and this buff should show his total apportionment, subdivided into amounts for contract, variations, structural fittings, Clerk of Works, &c. The amount of the tender is buffed, and also a sum in respect of the Clerk of Works' salary. Each buff estimate is numbered, and when the Architect orders any material or work, his instructions quote the number of the buff on which the approval for the expenditure has been given. The Measuring Surveyor who settles the final building account cannot pass any item of extra work unless its relative buff number is shewn, and it is a part of the Surveyor's duties to verify the number given with the actual buff.

Unforeseen circumstances, such as bad foundations, may result in the architect exceeding his apportionment. In such a case the excess expenditure is shown in red figures at the bottom right-hand corner of the buff. This is known as the architect's "red flag," and it may be necessary to review the whole work and if savings cannot be effected, to notify the Treasury of the probable total exceeding.

The contractor is paid from time to time on a certificate issued by the architect, whose duty it is to see that over-payments are not made and that the Department is safeguarded in the event of the contractor being declared a bankrupt.

The progress of the work is reported to the architect each week by the Clerk of Works. This report also shows the number of men employed in each trade, the value of the material and plant on the site, approximate value of the work executed, and the time lost due to causes allowed under the Contract.

All queries which arise during the progress of the work are submitted to the architect in writing by the Clerk of Works. Query sheets are provided for this purpose, divided into two columns, and the question is written in the left hand column and the answer given in the right hand column.

Samples of the bricks, stone, lime, sand, cement, timber, &c. are submitted and if approved are stamped by the architect and retained by the Clerk of Works, who must see that the bulk supply is up to the standard of the sample.

The names and addresses of all sub-contractors are submitted for the approval of the architect by the main contractor. On a large building, the steelwork, joinery, slating, asphalte, stonework, plumbing and glazing, may be sub-let. If the architect is dissatisfied with the work of a sub-contractor, complaint is made to the main contractor and not the sub-contractor.

It is not possible in the time at my disposal to consider in detail the inspections of a building during its erection. Needless to say, these must be made deliberately and systematically. It is not unknown for an architect to be kept "on the run" during an inspection in the hope that by this means he will omit to inspect a certain part of the work.

Among the outstanding items which need to be watched are: the packing of concrete with large bricks or stones, the omission to flush up the brickwork every third course, incorrect mixture of concrete and mortar, omission of dowels to wooden door frames, nailing of roof tiling less frequently than specified, the use of zinc soakers instead of lead; short hair in the plaster and sometimes none at all; the omission of one or more coats of paint; the omission of dampcourses in chimney stacks; fixing of door furniture before the doors are painted; fish oil in putty, instead of linseed oil.

On the completion of the works, a set of drawings is prepared showing the building as actually carried out.

A completion report is prepared and signed by the architect, giving the following particulars:—

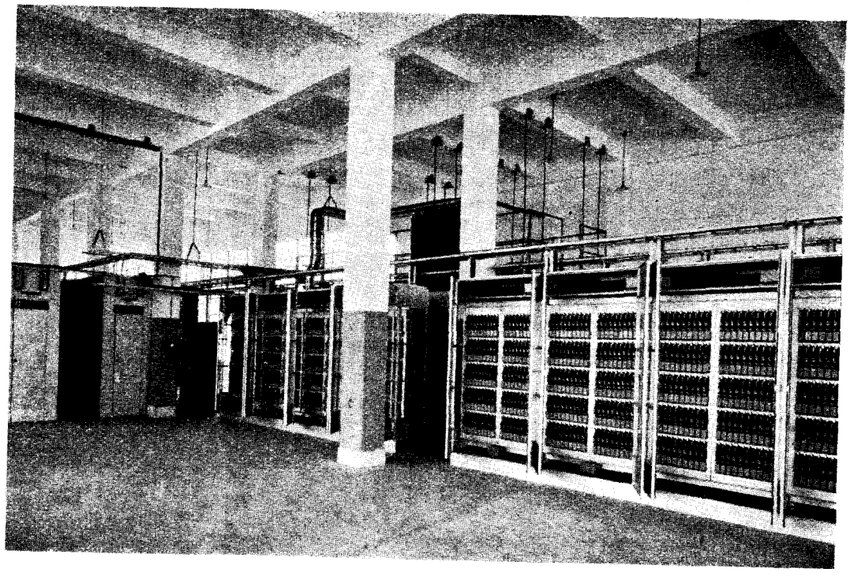
Town.
Building.
Date when building commenced.
Date when lower windows were formed.
Date when floors over were constructed.
Date when occupied.
Clerk of Works.
Builder.
Particulars of any easements appertaining to the property at time of purchase.
Particulars of any easements by which the property was dominated at time of purchase.
Particulars of any arrangements subsequently made in regard to any of the foregoing easements.

This concludes my paper. I am conscious that much has been left unsaid, but my subject is so comprehensive that a somewhat long series of talks would be necessary adequately to cover the ground.

* Paper read before the Post Office Telephone and Telegraph Society of London.

STROWGER AUTOMATIC

A Thirty-Five ear Development



Part of a large Strowger Multi-Office Exchange, Principe Office, Havana, Cuba.

AUTOMATIC Electric Inc. is the originator of the Strowger Automatic system of telephony, and for more than thirty-five years has been the leader in its development and application.

During this period, installations have been made by this Company in every part of the world, ranging in size from small exchanges of a score or less telephones, to immense metropolitan networks serving hundreds of thousands. Telephone operating problems have been met—and solved—with pronounced economic and technical success, by this modern equipment.

The experience thus gained is at the service of all who are interested in the modernization of telephone operation.

Automati Electric Inc.

Originators and Pioneer Manufacturers he Strowger Automatic Telephone System
Chicago, nois, U.S.A.

TELEPHONE EQUIPMENT

The
Telegraph and Telephone Journal.

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

Editing and Organising Committee - - - J. STUART JONES. W. D. SHARP. J. F. STIRLING. W. A. VALENTINE. J. W. WISSENDEN.

Managing Editor - - - W. H. GUNSTON.

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.*

VOL. XIII. MAY, 1927. No. 146.

RURAL DEVELOPMENT.

IT is a matter of fairly common knowledge that about 80% of the population of this country dwells in urban districts and only about 20% in the rural areas. The percentage of rural telephones to the total number existing in Great Britain was stated by the Postmaster-General in the debate on the Civil Estimates at the end of March to be 9.3%. This figure is surprisingly high when it is remembered how much more difficult it is to serve a telephone subscriber in a remote village than one in a busy town, and how much more alive the townsman is to the need of a telephone than the average countryman. Of course, the ideal rural development has not yet been reached, and we are convinced that when public opinion has reached the point (to which it is steadily moving) of believing that the telephone is a necessity for every home, the rural telephone density will be increased. We doubt if it will ever quite reach the figure for the urban districts, for the demand for service in the towns is always likely to be more brisk than in the country. Besides, as we have already said, the country is more difficult to serve. It is easy to appreciate that to extend costly pole routes to isolated subscribers, and to provide a high-grade service to a small village exchange with 8 to 12 members at a rate which they can afford is a problem of no small magnitude. There are several different ways of affording a telephone service in rural parts. In some continental countries the subscribers have to find the premises for the exchange and even the operating staff. In some parts of America small associations run a sort of co-operative exchange, and obtain service with the outside world, if their lines are good enough, by means of the trunk lines of one of the larger companies. In other countries the State provides the farmer with a cheap service at a heavy loss in the hope of obtaining a reward either on earth, if ever the service should pay, or else in heaven. In the meantime, of course, these good works are paid for either by the general taxpayer or by the telephone subscriber in the more remunerative areas.

The Post Office is in agreement with the principle that it is right and proper that the telephone system should carry so far as it can an unremunerative fringe of business in order to provide for constant expansion. Even in this country there is a loss of nearly £4 a year per subscriber on over 1,000 rural exchanges opened under a special scheme at unremunerative rentals.

When, therefore, any reduction in rates is suggested, it is necessary to point out that under existing conditions this course could only result in a few years in creating an economic position in which either all telephone rates would have to be raised or the general taxpayer would have to subsidise the telephone service.

It may, we think, be claimed that the Post Office has adopted a fair middle course between restricting rural development by demanding fully remunerative but prohibitive rates and unduly forcing its expansion at the expense of the urban subscriber.

HIC ET UBIQUE.

THE annual report of the American Telephone & Telegraph Company for 1926 shows further remarkable progress by that company and its associated operating companies during last year. The following are some statistics of the "Bell" system :—

	1926.	Increase.
No. of telephones—		
Bell Companies	12,816,252	
Companies in connexion	4,758,000	
Total ...	17,574,252	854,028
Exchanges	5,998	
Miles of exchange wire ...	44,564,234	4,723,394
„ toll (trunk) wire ...	6,296,916	664,216

It happened in Dale Street, says the *Liverpool Post*, as most folk were hurrying to and fro on business bent. A well-dressed man, carrying what seemed suspiciously like a frame aerial, with a phone attachment to his ear, was treading gently over the setts in a circumscribed area.

Was he trying to pick up Daventry ? None dared to disturb him. He moved away, and in a very short time half a score of workmen, with a handcart laden with repair paraphernalia, appeared on the scene, and set to work evidently to repair a fault in the electrical service. Thus quietly do brains and muscle work to maintain the city's life.

It is an interesting fact that wireless receiving plant can be used to find faults in power cables—instead of or in addition to the usual measuring instruments.

We learn from Reuters Trade Service that the Allmaenna Telefonaktiebolaget L. M. Ericsson has received an order from the Government of Ecuador for the complete reconstruction of the telephone system in Quito, the capital. The new system will be equipped to serve 2,000 subscribers to begin with.

A new automatic telephone exchange has recently been brought into use at Edmonton, Canada, to serve the south district. It was manufactured and installed by Siemens Bros. & Co., Ltd., Woolwich, and is the No. 16 system with an initial equipment of 2,300 lines and ultimate capacity for 5,500. It supersedes an old 3-wire system with push-button ringing, and is the first portion of the scheme in hand to provide Edmonton with a modern fully-automatic system of 100,000 lines.

The laying of a direct telephone cable joining Budapest with Vienna, Frankfort, Munich, and other German towns is nearly finished. The development of the Hungarian telephone system is making great progress, and in about three years all towns and many villages in Hungary will be connected by telephone.

The following paragraphs appeared in many of our contemporaries :—

"WIRELESS SHERLOCKS.

Under the new B.B.C. *regime* a rigorous campaign of "witch-hunting" for offending oscillators is being enforced. Complaints on the score of serious interference through oscillation in the neighbourhood are received at the B.B.C. headquarters averaging about 100 per diem, and a fleet of motors, equipped with detective apparatus, is employed to search out the "criminals." Much success is reported from these energetic methods. It is a real chapter in the divine human comedy to watch what happens when a detective B.B.C. motor suddenly pulls up in some quiet suburban street. Not only is its mission apparent to all, so that a small crowd soon grows in the street, but at most upper windows anxious faces begin to show."

But the real facts are that the Post Office and not the B.B.C. has one car fitted with direction finding apparatus which is doing much useful work in detecting oscillators ; and the witch-hunt by a fleet of motors and its attendant horrors are, we submit with great deference to our contemporaries, merely a pack of nonsense. In any case it must be many years since the appearance of a motor-car in a suburban street caused even the faintest throb of interest.

Direct telephone connexion between Spain and Gibraltar was inaugurated on April 5 by a conversation between the Spanish Consul at Gibraltar and a Secretary of State at Madrid. A conversation was also held between General Sir C. C. Monro, Governor of Gibraltar, and Sir Horace Rumbold, the British Ambassador at Madrid.

The cost of a message between Gibraltar and Madrid is 5*s*. for three minutes.

BROADCASTING IN JAPAN.

ORDERS have been placed with Standard Telephones and Cables Limited, for the complete radio equipment for three Broadcasting Stations, their associated studios and the necessary machinery, for the Japanese Broadcasting Association.

The equipments which are manufactured at the Company's London factory afford the power of 15 kilowats according to the Geneva system of rating, so that the stations will have three times the power of 2 L.O. and more than six times that of other British stations except 5XX.

TELEPHONY FROM VARIOUS VIEWPOINTS.*

BY AGNES E. COX, LONDON TELEPHONE SERVICE.

WHEN I started to write this paper, I was met at the outset by a difficulty—in no dictionary could I find a definition of the word "Telephony."

Legally, I understand, telephony is telegraphy—at least I deduce this from the finding of the Court which, in the case of the Postmaster-General of the United Telephone Company, heard in December 1880 to decide whether the sending of a message through the medium of the telephone could be held to infringe the monopoly of the Postmaster-General, held that the Edison telephone was a telegraph within the meaning of the Telegraph Acts 1863 and 1869, although the telephone was not invented or contemplated in 1869 ; also that a conversation through the telephone was a "message," or at all events "a communication transmitted by a telegraph," and therefore a "telegram" within the meaning of those Acts.

Turning to the dictionary again, I find telegraphy described as the art or practice of communicating intelligence by a telegraph—the person who communicates the intelligence being described as a telegraphist.

Bearing in mind the essential difference between the work of a telegraphist and that of a telephonist, viz., that the former actually transmits messages while the latter normally only sets up such connexions as will enable other people to transmit them, I propose to discuss Telephony as the art or practice of switching telephone circuits in order that intelligence may be communicated by telephone.

Last year, the year of the Telephone Jubilee, was the occasion of many speeches, papers and newspaper articles dealing with the past history of telephones as well as with their future development ; I crave pardon, therefore, for making my first viewpoint of telephony a retrospective one.

In an address entitled "The Birth and Babyhood of the Telephone," Mr. Thomas A. Watson says, "in August 1877, Professor Bell (who I believe is generally accepted as the inventor of the telephone and who therefore made telephony possible) married and went to England taking with him a complete set of up-to-date telephones with which he intended to start the trouble in that country."

In September 1877, Professor Bell's representative offered to exhibit the telephone to the British Government with a view to its adoption by the Post Office, but the offer was not accepted.

In January 1878 Professor Bell exhibited his new invention before Queen Victoria at Osborne, connexions being made between Osborne House, where the Queen was in residence, and Cowes, Southampton, and London, the notes of a bugle in Southampton and the tones of an organ in London being heard with equal success.

Although the possibilities of transmitting speech by telephone were known as early as 1876, the art or practice of telephony can hardly be held to date earlier than 1878, when the first public exchange was opened in New York ; during the interval the telephone had been put to practical use, but only as "private wires" between two fixed points. It is interesting to note that one of the first of the private wires to be installed in England connected the private apartment of Queen Alexandra, then Princess of Wales, with her royal nurseries.

In August, 1879, the first telephone exchange in Europe was opened by The Telephone Company, Limited, at 36, Coleman Street, London, with seven or eight subscribers. It may interest some of my hearers to learn that one of the first undertakings to avail themselves of this new facility was the old London, Chatham & Dover Railway.

New subscribers were quickly forthcoming, and at the end of the year the Telephone Company's system served about 200 subscribers.

I do not propose to trace the history of the telephone service as it passed from one company to another until it came under the sole control of the Post Office in January, 1912, but the following facts and figures may be of interest as indicating its rapid growth :—

The first authentic printed list of telephone subscribers which can be traced is dated April 26, 1880. It contains 407 names and shows 7 exchanges as open or about to be opened. It is interesting to note that some of the subscribers in this original list are subscribers to-day, although, all the seven exchanges mentioned in the list have since been closed. The name of one, Hop, derived from the fact that the original Hop Telephone Exchange was actually located in the Hop Exchange, is retained by the existing exchange in Marshalsea Road, the third exchange to bear this name.

This first directory gives the subscribers no exchange numbers, presumably, therefore, it was customary to ask for subscribers by name—a practice which curiously enough we accept again in connexion with the transatlantic service.

Later it became the practice to call by number, but there was only one sequence of numbers for all the London exchanges, a different part of the

*Paper read before the Post Office Telephone and Telegraph Society of London, Feb. 21, 1927.

sequence being assigned to each exchange—thus all the numbers between 1 and 900 were on Coleman Street, between 901 and 1400 on Avenue and between 1501 and 1900 on Queen Victoria, &c. It is interesting to reflect that primitive though it may seem, we are in reality reverting to this system of a single sequence when we introduce automatics, although to assist the subscriber we are camouflaging the first three figures of the number by translating them into the first three letters of his exchange name.

Between 1880 and 1912, the date of the transfer of all the exchanges of the National Telephone Company to the State, the number of the exchanges in London had grown from 7 to 95, of which 62 belonged to the N.T.C. and 33 to the Post Office, and the number of subscribers from 407 to 126,668, of which 74,774 were on the N.T.C. and 51,894 on the Post Office system.

The present figures are 112 exchanges accommodating 300,970 exchange lines and 526,952 stations. The difference between the number of exchanges existing in 1912 and to-day, viz., 17, gives, however, quite an incorrect idea of the development during this period. At the time of the transfer the National Telephone Company and the Post Office were competing in many areas—at the transfer the competition ceased and in 18 places where rival exchanges existed in the same area amalgamations were effected.

During the past 15 years practically every exchange in London has been considerably extended: 38 additional exchanges have been opened and 29 existing exchanges have been transferred to new premises.

The growth of the system and the necessity for intercommunication between the various local centres which were speedily opened up in all parts of the country, resulted in the development of the Trunk system inaugurated by the opening of the first trunk line between Leeds and Bradford in 1880.

Owing to the proximity to each other of the large provincial towns in the North and Midlands, and the comparative isolation of London, the trunk system developed much more rapidly in the North and Midlands than in London. As late as 1889, London was entirely without long-distance telephone communication, with the single exception of a line to Brighton.

In 1892 the Postmaster-General purchased all privately-owned trunk lines taking them over for traffic on April 4, 1896. The total mileage purchased at this date was 28,998 miles.

The present mileage is approximately 125,000 miles, comprising 81,700 miles of trunk lines, 28,500 miles of toll lines and 14,800 miles of cables for Continental work.

In 1896, when the Postmaster-General took over the working of the trunk system, the Trunk Exchange, London, was housed in a small room off the cable room in G.P.O. West, with only one window looking into a well of the building. The comparatively small amount of traffic handled at that time may be imagined from the fact that during the day all the originated calls were received over one order wire, and that after 6 p.m. this order wire was connected to a wall telephone, the indicator of which was fixed so high up that on receipt of each call the telephonist had to mount a chair to restore it and stop the bell. At first no transfer position was provided for the completion of through calls. There were permanent connexions between the boards, each connexion being distinguished by a letter, not a number, and the standard method of asking for a through call was to call down the switchboard in this wise: "Miss Brown, can I have Glasgow on D please?"

Within a few months it was necessary to provide a much larger Trunk Exchange at G.P.O. West. This in its turn was outgrown, and in February 1904, the London Trunk Exchange found the home which it still occupies at G.P.O. South. Here it continues to grow, demanding more and more space. At present in addition to the switchroom accommodation originally assigned to it, a second switchroom known as Annexe has been opened, and the record work has been transferred to a room on the first floor of the same building. Further, it has been relieved of nearly all the traffic between London and places within a radius of 50 miles. This is now dealt with in the Toll Exchange.

Some extent of the growth of trunk and toll working may be judged from the following figures: In the month of December, 1916, the number of originated calls dealt with in the Trunk Exchange was 273,696, and the revenue earned £21,771. In December, 1926, the calls dealt with in trunks and toll (which was separated from trunks in 1921) numbered 749,608, an increase of 180%. The revenue earned was £66,167, an increase of over 200%.

Perhaps in no direction does the growth of the telephone system appeal more strongly to the imagination than in the international field; for may it not be one of the links in a chain now being forged to knit all peoples more closely together and to teach us that happiness and prosperity come from co-operation and mutual goodwill.

The first international telephone circuit to be opened was that between Paris and Brussels in 1889. This was followed by the opening of two circuits between London and Paris on April 1, 1891. For a considerable period Continental calls between England and the Continent were limited to connexions between these two cities, but it is now possible to effect calls between subscribers in all parts of the British Isles and France. Direct communication has also been opened up with Belgium, Holland, and Germany—there are now 52 circuits working between England and the Continent—and within a comparatively short period of time there is little doubt that it will be practicable to ring up subscribers in all parts of the Continent of Europe.

The following figures give some idea of the growth of the Continental Service. In December, 1904, 2,408 calls were received, this number was increased in December, 1926, by 840% to 22,609 calls, bringing in a revenue of £14,569.

But undoubtedly the greatest achievement in telephony was the opening of the transatlantic service on Jan. 7 last, which was rendered possible by wireless telephony.

It was my privilege to speak to New York and Boston, U.S.A., as early as June last, during the experimental stages, and on Christmas-eve last, I was able to convey the good wishes of the London Staff to their colleagues in New York, the speech in both directions being perfectly distinct and clear.

I am very conscious that most of the facts which I have cited up to the present are probably as well or better known to my hearers than to myself, but it seemed necessary to indicate broadly the lines on which telephony has developed, in order to introduce what I wish to make the most important viewpoint of this paper, that is, Telephony as a career for women.

Telephony as a career became possible with the opening of the first exchange in 1879, but at first the employment was given to boys. Mr. F. G. C. Baldwin, in his "History of the Telephone," writes that when the first telephone exchanges were established in this country, boys were almost invariably engaged as operators, although there were some exceptions, and for several years boys continued to be so employed. "No doubt," he says, "boys in their teens found the work not a little irksome, and it is also highly probable that under the early conditions of employment the adventurous and inquisitive spirits of which the average healthy boy of that age is possessed, were not always conducive to the best attention being given to the wants of the telephone subscriber.

"However that may be—in a few years' time girls began to appear at operators in replacement of the boys, and it was soon appreciated that the work of telephone operating demanded just that particular dexterity, patience, and forbearance possessed by the average woman in a degree superior to that of the opposite sex. In short, telephone operating proved to be just the sort of work for which girls were admirably fitted." Personally, I feel that this criticism is distinctly hard on the boys. I have a distinct recollection of being in the switchroom on one occasion (in the very early days) when all the Trunk lines running on one route were, during the period of the early morning test, connected together by the girls who listened in circuit to the various engineering officers reporting to each other the lines on which they were speaking and discussing the point at which such a full contact could have occurred. After a minute or two the lines were disconnected one by one.

There is no doubt that telephony was one of the first careers, if not the first, to be opened in the business world to women, and it has continued to provide year after year an increasing number of suitable openings.

On Jan. 1, 1912, the date of the transfer of the National Telephone Company to the State, the number of women employed in the exchanges was 3,453, including 1,472 already in the employ of the Post Office and 1,981 transferees.

The number of women employed on operating and supervising duties on Dec. 31 last had increased to 7,902, but the rate of wastage is so high that this figure gives no indication of the number of women who pass through the service.

The number of new entrants during the past 12 years (exclusive of those employed on the night staff during the war) was 13,465, an average of 1,036 yearly.

During the past three years the number of new entrants has been 3,494 an average of 1,164 yearly. During the same period the average wastage has been 686, the difference of 478 per year being accounted for by the growth of the service.

The high rate of wastage is in many respects a very satisfactory feature, as it results in a steady influx of youth, and there can be no doubt that youth is an asset in telephone operating. It is accounted for mainly by resignations for marriage and by promotions which averaged 350 and 79 per year respectively, during the last three years.

The high wastage is somewhat costly to the Department on account of the number of new entrants who have to be trained and also in respect of marriage gratuities. I always feel that the number of marriages is an indirect tribute to the ability of the interviewing officers who select the candidates.

Candidates are selected by interviewing officers who are supervisors experienced in exchange work and know from practical experience the type of girl required.

Some idea of the extent of this work may be judged from the following figures which are the average yearly for the past three years:—

Application forms received	7,897
Candidates interviewed	6,716
Candidates nominated to Civil Service Commissioners	1,045

The fact that only about 20% of the candidates interviewed are considered suitable for nomination reflects, I consider, very adversely on the present elementary school system, as the majority of the 80% rejected candidates are deemed unsuitable on account of defective speech or inability to spell or write clearly. A record taken recently of 200 consecutive interviews showed that 40% of the candidates spelled incorrectly at least five words out of a list of twelve—the list comprising such comparatively simple words as Urgent (usually started with an E)—Necessary—Government—Juvenile—Economy.

If one had time to compile it, a whole volume might be written on the humorous side of the recruitment work. In order to test her general intelligence, the candidate is sometimes asked to define words given in the spelling test, the following are a few definitions given recently :—

Combustibles	People who are waiting for a bus.
Civilian	A civilised person.
„	A foreigner.
Juvenile	Someone who comes after a place.
Bicycle	A thing to run "errants" on.
Leisure	Pleasure.

One bright youngster asked to define antique, promptly replied, "I don't know, but you could find it in a dictionary."

Another in answer to a question on the form of application—"Have you a strongly marked local dialect?" replied "No, but I will endeavour to acquire one." Yet another admitted to a cockney accent acquired in Liverpool.

After passing the interviewing officer the candidates are examined medically (about 10% fail to pass this examination). Those successful in passing the medical examination are nominated to the Civil Service Commissioners, and 99% of them obtain their Civil Service Certificate. The low number of rejections at this point is, I consider, a tribute to the care and efficiency of the interviewing officers.

I have endeavoured during the past few minutes to make it clear that there is a constant demand for healthy, well-educated girls between 16 and 19 years of age in the Telephone Service, and it is always a matter of concern to me that in these days when unemployment is so rife, we should have to resort to frequent advertisement to fulfil our requirements.

We obtain a certain number of candidates from the relatives of Civil Servants, and these are usually the best type, appreciating the value of a Civil Service appointment and having the traditions of the service behind them.

Our demands are constantly before the Ministry of Labour, but the rejections of applicants from this source are higher than the average, due probably to the fact that the parents of the girls up to the standard that we require still look askance at the Ministry of Labour as a means of starting their daughters in life.

But I think our handicaps are to be found chiefly in a fairly general misconception as to the social status of the girls we require, and to a still wider prejudice against the work, on the assumption that it is nerve-racking and detrimental to health.

The misconception is evidenced by the remarks of subscribers and others visiting exchanges who frequently say that they had no idea that we employed such bright bonny girls (quite evidently they had expected them to be of the factory type), and by the unsuitable candidates who are sent to us on occasions by quite highly placed people who wish to bestow a little patronage.

The prejudice is shown by the number of requests I receive for my "real" opinion as to the outlook for a girl taking up telephone work, especially from the point of view of health.

My "real" opinion is that for a girl who has made good use of an elementary or secondary school education, it is a most suitable career. It offers all the advantages of an established Civil Service appointment, which I need not detail to this audience, and girls who take it up have certain advantages over the outside public with regard to competitions for the higher appointments for women in the Civil Service.

The work is carried on in bright airy switchrooms, which are usually gay with flowers—there are pleasant recreation rooms and very satisfactory refreshment clubs, managed by the staff, where really good meals can be obtained at a reasonable cost.

Although the staff is able to remain seated during practically the whole of the day, the movements of the body required in carrying out the necessary switching operations overcome the objections to a purely sedentary occupation, and the fact that the telephonist is always in touch with human beings and dealing with calls concerning current events, give to her work a zest which is absent from such work as accounting, sorting, book-keeping, &c.

On the other hand, she never has arrears of work to worry her, or a balance that won't come right. When she takes off her telephone and leaves the switchroom, she can drop all thought of her work and thoroughly enjoy her leisure. Recently this leisure has been increased for new entrants by the introduction of a 36-hour duty during the first 2 to 3 years service. This reduction in the hours of duty of the junior staff results in a better co-ordination of staff to traffic ; it should also be beneficial to the junior telephonists in that it makes the transition from school life to full duties, during the adolescent period, easier and gives more time for study for those who wish to qualify for higher posts. The 36-hour duty is regarded as established service and counts for pensions, &c.

The coming of Automatics is another bogey which scares some parents who fear that it will result in wholesale dismissals of staff, not realising that even with automatic working a certain amount of manual work is required.

In effect the introduction of automatics will transfer to apparatus operated by the subscriber only the routine portion of a telephonist's work, leaving to the telephonist the residue which requires thought and intelligence.

In London a subscriber on an automatic exchange will require to call a telephonist to operate all calls outside the first fee area ; at present these comprise from 1 to 10% of the local traffic, the percentage increasing with the distance of the exchange from the centre of London ; all Toll and Trunks and all foreign and transatlantic calls. Further, telephonists will still be required in each exchange to deal with all calls originated at call offices, with enquiries and complaints, at certain points, with directory work and work on the street index, while the phonogram service will, no doubt, require an increasing proportion of staff as its usefulness becomes more widely known and appreciated.

The advent of automatics will tend to upgrade the work of the telephonist, by relieving her of her more routine duties, and should further improve her status.

With the rapid development of telephones inevitable in London, the staff is never likely to be less than it is at present, in all probability it will be considerably greater, and any temporary redundancies which may be occasioned as manual exchanges are transferred to automatics will easily be met by the normal wastage and the slowing-up of recruitment for a time. In this connexion it is interesting to note the opinion of Mr. K. W. Waterson, of the Bell Telephone Company, U.S.A. Writing in the *Bell Telephone Quarterly* for October, 1926, he says : "It is interesting and important to note that, with the increasing growth and complication of the business, the requirement for telephone operators on a manual basis increases considerably more rapidly than the population. This problem has been very carefully analysed for all important cities and the number of girls estimated who have to work or wish to do so, who would be suitable for telephone work and who would like the work. From 1910 to 1920 our requirements for telephone operators in proportion to the population and number available nearly doubled, and if the manual system were continued, it would not be very many years before the requirements for telephone operators in comparison with the number of people available would present serious problems. I think it is not an overstatement to say that it would not be practicable indefinitely to give telephone service at reasonable cost in the large metropolitan areas if we had to operate on an all-manual basis. This, of course, is another strong argument in favour of the automatic system. Even with the large machine program, however, we will require more operators in 1930 than we do to-day, and it will be a long time before the operating force will be materially decreased. In fact, we will always need a great many telephone operators both for toll work, for many calls that cannot be handled by machine, for private branch exchanges and for other work, and operators need have no fear that their occupation will vanish on account of the introduction of the machine switching system. That system, however, will keep the employment problem within reasonable bounds which would have been exceeded on all manual basis."

A comparison of the growth of the population of Greater London and the increase of the number of day telephone operators employed shows that in London we are faced by practically similar conditions, for whereas the percentage increase of population in Greater London for the period Jan. 1, 1922, to Dec. 31, 1925, was 2.1%, the increase in the number of telephone staff for that same period was 27.1%.

Telephony offers careers with additional remuneration to women with a knowledge of foreign languages. At present the languages required are French and German. French is used on the French routes and English primarily on the Dutch and German, with German on the latter as an alternative. English will be used on the Scandinavian lines.

It is anticipated that as telephone communications with the various European countries are opened up they will fall into three main divisions with regard to the languages used in operating :—

Latin countries using French ;

Teutonic countries using English primarily and German alternatively ; and

Other countries using English without question.

The language standard required of the telephonists—"ability to converse fluently over a telephone circuit with a foreigner who knows no English"—is a high one, and one of the most difficult problems of the recruitment section is to obtain suitable candidates for this work. Efforts in this direction have led me to the conclusion that in very few English schools is any real attempt made to give more than a superficial instruction in foreign languages. Before the war we had a fairly reliable field for recruitment in the Convent schools of France and Belgium, at which a certain number of English girls were educated, but this source was closed during and for several years after the war ; and since it has been reopened, the number of positions for English girls with a knowledge of languages, outside the telephone service, has materially increased.

So great was the difficulty in obtaining suitable candidates that before the German cables were brought into use the Post Office found it necessary to engage an instructor for a time to build on this superficial foundation, and it is practically certain that with the rapid expansion of international work contemplated in the near future, it will be necessary to resort to this means again. It may interest some of my hearers to know that during the past year interchanges of staff took place between London and Paris, practically all the London French Operating staff, which then numbered between 20 and 30, spending two weeks in the various Paris exchanges.

(*To be continued.*)

REVIEWS.

"Die Stromversorgung von Fernmelde-Anlagen" (The Supply of Current to Tele-communication Installations.) By G. Harms. (Published by Julius Springer, Berlin. 137 pages. Price: paper cover, 10.20 marks; bound, 11.40 marks.)

This is a very full and up-to-date account of the various devices used to supply current to line and wireless telegraph stations, and to telephone exchanges and telephone subscribers' apparatus.

The main sections into which it is divided comprise primary batteries, secondary batteries, rectifiers, rotary transformers, pole changers, hand and power generators for ringing currents, the use of an alternating lighting supply for ringing purposes, and also, in certain cases, for the supply of current for speaking purposes, the working of telephone exchanges direct from generators, charging boards, automatic arrangements for charging secondary cells and for the supply of current only when actually wanted to telephone installations where the amount of traffic is small, and the testing of lines and batteries. The book concludes with a useful table in which are given, for every different kind of telecommunication device, from the humble house bell to the 20 kilowatt wireless station, firstly, the current consumption; secondly, the type of current source which should be employed; and lastly, a reference to the pages in the book where detailed information may be found.

The book is very fully illustrated with photographs of apparatus and diagrams of connexions. The paper is good, and the printing and the reproduction of the illustrations are excellent. It should be included in the library of every telegraph and telephone engineer, and, for the benefit of those who are unable to read the present German text, we hope that some enterprising publisher will see his way to issuing an edition in English.

"Elements of Physics." By Millikan and Gale. (Published by Ginn & Co., Ltd., 7, Queen Square, London, W.C.1. 522 pp. Price 7s. 6d. net.)

The subjects included under the term "Physics" have changed so radically during recent years, that even those of us whose student days are not so very long ago find at every turn, facts and conceptions with which we are unfamiliar. The growth has been and continues to be so rapid that, unless one can keep in continual touch with the latest developments as recorded in the various scientific publications, one inevitably falls behind. Few of us, however, have the time for thus keeping our knowledge up to date, and therefore a book such as the one under review, which covers concisely the whole ground as known at present, is very welcome. The subject matter has been brought completely up to date, as examples of which we may mention the Rugby-New York telephone service, and the rotor ship, both of which are dealt with. A very attractive feature is a series of good reproductions of portraits of eminent physicists, from Dr. Gilbert to Einstein, with brief biographical notes.

The book is very fully illustrated, and the reproduction of the pictures and diagrams leaves nothing to be desired. We can confidently recommend it to those who wish to obtain an interesting introduction to the subject, and also to those, already mentioned, who wish to bring their knowledge up to date.

"Astronomy." By Russell, Dugan and Stewart. (Published by Ginn & Co., Ltd., 7, Queen Square, London, W.C.1. Volume I, 470 pp. Price 10s 6d. net.)

At first sight the subject of astronomy is one with which those whose work is connected with telegraphs and telephones would not seem to need any acquaintance. Actually, however, the study of the heavens and the business of electrical communication are by no means entirely separated from one another. The provision to the community of accurate time is a subject in connexion with which these two branches of science are closely related. The varying activity of the sun, as shown by the increase or decrease in the number of sunspots, is reflected on the earth in magnetic storms which frequently seriously affect our lines of communication, both with and without wires, and at times cause them to be completely interrupted. The mechanism of the transmission of wireless waves over the surface of the earth is probably intimately connected with effects produced by the sun, and recent research tends to show that also the moon, and possibly even the planets, may exert an influence on the efficiency of wireless communications. Finally, some knowledge of astronomy is necessary for those concerned with that application of wireless to navigation known as "direction finding."

Up to the present, however, there has been a dearth of books suitable for those who wish to acquire some knowledge of astronomy beyond the standard of the purely popular book, but at the same time have neither the time, nor possibly the necessary preliminary training, to enable them to read the standard works on the subject. For such, the present book is exactly what is required. The subject is dealt with in a thoroughly sound and scientific manner, while at the same time the treatment does not assume from the reader more than the elements of mathematics and physics.

The volume under review first deals with astronomical instruments and the observations and measurements made by their aid, and then describes in detail the various bodies which make up the solar system. The results of the latest researches have been incorporated.

After nearly every chapter a number of exercises is given which enable the reader to test for himself whether there are any points which he has not properly understood.

The style of the book is eminently readable, and its interest in enhanced by a wealth of illustrations, including actual photographs of every object described. We can thoroughly recommend it to our readers, and we shall look forward with interest to the appearance of the second volume.

"The Practical Telephone Handbook." By Joseph Poole, A.M.I.E.E. (Published by Sir Isaac Pitman & Sons, Ltd. Seventh Edition. xxv + 870 pp. Price 18s. net.)

We are pleased to welcome the appearance of a revised and enlarged edition of this familiar treatise on telephony. The contents of the sixth edition have been completely revised and largely rewritten, while much obsolete matter has been cut out and extensive additions made to bring the book, as far as is possible with a subject in such a state of continuous development, completely up-to-date.

The whole subject is thoroughly covered. The first chapter deals with the fundamental electrical laws on which telephone engineering is based. The second chapter deals with batteries, and the third gives a brief review of the history of the telephone. Then follows chapters on receivers, transmitters, sub-station apparatus, switches and extension working, intercommunication arrangements, switchboard apparatus, relay and lamp signalling, the various types of exchanges, junction, trunk and party line working, power plant, line construction, loading, multiplex telephony, submarine telephone cables, fault localisation, testing and measurements, repeaters, wireless telephony and telephone statistical studies. The final chapter deals with miscellaneous devices such as automatic call boxes, fire alarms, telewriters, &c. In an appendix is given a number of useful reference tables.

The book is very fully illustrated, the reproduction of the diagrams is good, and the standard of the earlier editions has been well maintained.

P.O. RELIEF FUND.

PRESENTATION TO MR. W. G. WOOD.

A MEETING of the Local Committee of the C.T.O. Branch of the P.O. Relief Fund on Wednesday afternoon, April 6, was made the occasion of a most pleasing ceremony.

The late Hon. Sec., Mr. W. G. Wood, was the recipient of a canteen of cutlery and half a dozen spoons as a small token of appreciation from the past and present members of the C.T.O. Committee.

The Chairman, Mr. F. T. Wadley, said that even in his short experience on the Committee he had, on many occasions, found how sympathetically the retiring Secretary had treated all cases coming before him.

Miss M. Tynan spoke on behalf of the female members of the Committee. She had great pleasure in bearing testimony to the splendid work Mr. Wood had done and the efficient way it had been carried out. The point that had struck her most was the intensely sympathetic manner in which Mr. Wood had handled every case, adding the personal touch to each.

Mr. J. L. Harris, on behalf of the Cable Room members, also paid a very high tribute to Mr. Wood's work. He had by his intense sympathy placed the work of the Committee on quite another plane to that of mere relief.

Mr. A. W. Edwards, O.B.E., late Deputy-Controller, C.T.O., and Chairman of the C.T.O. Branch of the P.O. Relief Fund, who had made a special journey for the presentation, spoke eulogistically. Associated as he had been from the beginning, he had seen the capable way in which the Hon. Sec. had dealt with the rapidly growing work. He had a wonderful knack of marshalling the salient points of each case. Carried out under the strain of the war period, and during a period of domestic trouble, Mr. Wood had never failed to deal sympathetically with every case that came forward. As those cases had grown in number, he had no doubt that Mr. Wood had given much of his own time to the cause of alleviating the distress of others. He had never known a man who did his work with such splendid heart as Mr. Wood. In making the presentation he hoped that he would live long in happy retirement and find the little gift of the Committee, which he trusted Mr. Wood would find useful, remind him of a very happy association on the Committee.

Mr. Wood was greatly moved by the tributes paid to him. It was with some difficulty that he could speak and reply to the various speakers. Suffering as he had suffered for many years past from the fact that his wife enjoyed but poor health and was confined to her bed practically all the winter, he had realised that there was a great bond of sympathy between himself and the dependants of his colleagues who had been killed in the war and whilst rather dubious at first of accepting the position of Hon. Sec. he later thought that he could help towards alleviating the distress of others by acceptance.

He also paid tribute to the patience and fortitude of his wife in her illness and to the devotion of his daughter which had enabled him to accomplish what he had. He also referred to the kindly consideration and quiet sympathy pervading the atmosphere of the Committee. He could assure the Committee that he was deeply grateful and appreciative not only for their expressions of appreciation of his work but for the gift itself.

After tea had been served Mr. J. J. Tyrrell, late Superintendent, Cable Room, who also had made a special journey to be present, spoke of the way Mr. Wood did the work, exhalting and ennobling it by his personality and thus enhancing the value of the monetary assistance which the liberality of the donors to the Fund had made possible. E. C.

THE FORWARD MOVEMENT IN TELEPHONES.

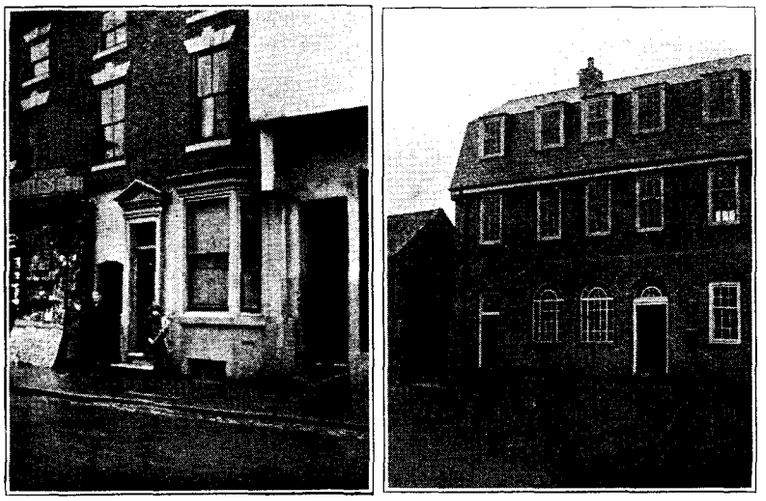
THERE are occasions when those whose duty it is to deal with the administration of telephone matters are especially conscious of a definite thrill of satisfaction in viewing signs of advance. "Here a little, there a little" the service is growing.

The recent transfer of the Exchange at Ashbourne, Derbyshire, from its former home to the newly erected Head Post Office typifies what must be a general experience in these days.

The bright and cheerful switchroom, the two front windows of which can be seen on the right of the first floor in the accompanying photograph, together with the excellent welfare accommodation, afford a welcome contrast to the old location, and there is every reason to believe that anticipations of development will be realised under the more favourable conditions.

It may interest readers of the *Telegraph and Telephone Journal* to be reminded that almost immediately opposite the old exchange building is the Green Man Hotel, which boasts eulogistic mention by James Boswell of its hospitality.

In the same street also is the house at which Dr. Samuel Johnson used to visit his friend, Dr. Taylor.



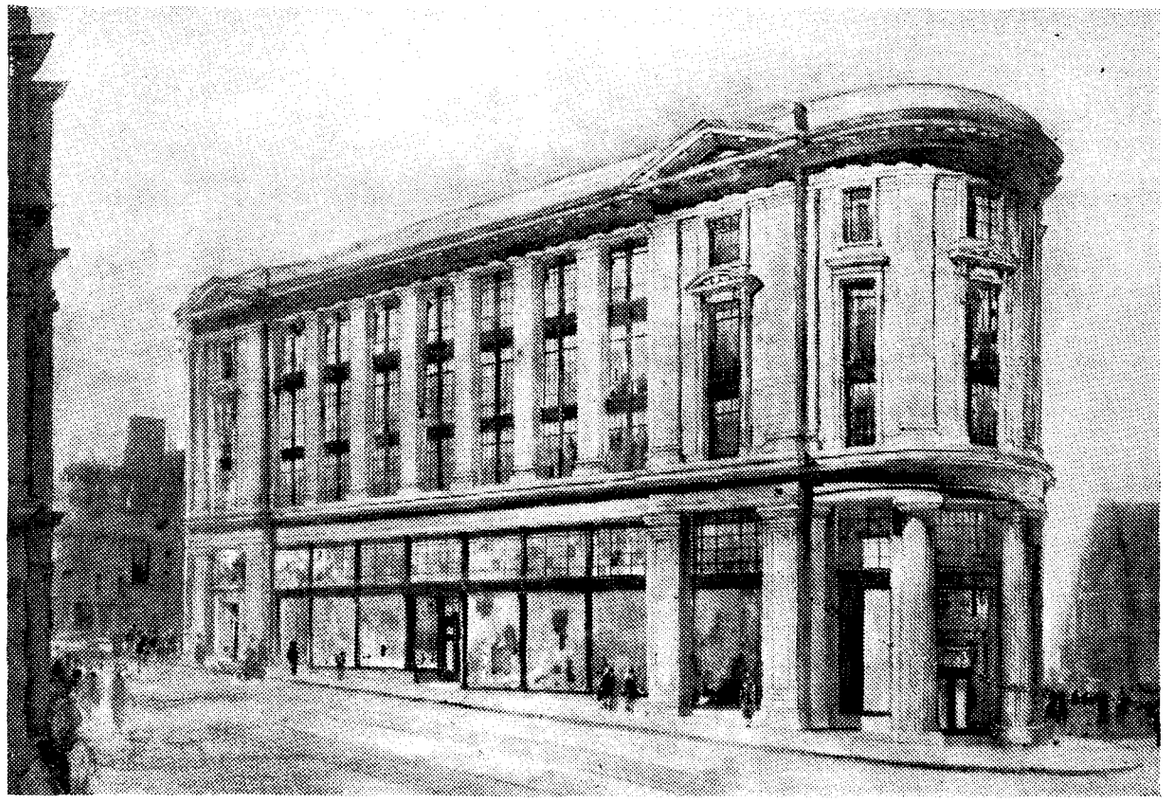
THEN. NOW.

ASHBOURNE TELEPHONE EXCHANGE.

One wonders what Dr. Johnson would have said had he been told that at a period not so very remote he would be able from this house, so jealously preserved, to telephone to the United States of America. A stretch of the imagination, perhaps, but do we not the better appreciate the progressive modern days by their relation with the interesting past?

(Ashbourne New Post Office and Telephone Exchange was opened officially, by the Chairman of the local council on Feb. 28, 1927. The building is Georgian in character and faced with hand made multi-coloured bricks. It was designed and erected under the supervision of Mr. W. N. Ludlow, A.R.I.B.A., Architectural Assistant to the Secretary, General Post Office.)

W. L. EVELEIGH.



SHEFFIELD : NEW EXCHANGE.

SHEFFIELD AUTOMATIC TELEPHONES.

SHEFFIELD had very early association with the telephone service, one of the first provincial exchanges having been opened there in 1879 by a local engineering firm, Messrs. Taskers. A few years later the National Telephone Co. opened a competitive exchange, and after 5 years of rivalry the whole system was taken over by the company and combined into one exchange, which was installed in the same premises as have been occupied up to the present time by the Central Exchange. An entry in the Central Exchange Visitors' Book reads as follows :—

" New Switchroom first tried this day, proceeding satisfactorily."
(Signed) George Franklin, Sheffield, Feb. 18, 1893.

The passage of time has rendered the Central Exchange and its numerous sub-exchanges obsolete and the whole have now been replaced by the up-to-date automatic system.

Shortly after midnight on Mar. 5-6, 1927, Colonel Purves, the Engineer-in-Chief, dialled the telephone number of the residence of Sheffield's Lord Mayor (Alderman J. G. Graves) and informed the Lord Mayor that his circuit had been transferred to the automatic equipment as the first item of the general transfer which was then in active progress, and which in a few minutes would effect the disconnexion of all the subscribers' lines in the Sheffield area from the eleven manual exchanges which had hitherto served them and their reconnexion to the nine new automatic exchanges in various parts of the area.

After preliminary words of thanks the Lord Mayor said : " We recognise that such an improvement as will facilitate quicker and surer communication, will at the same time do away with much of the nervous tension and irritation incidental to a system no longer equal to the demands which modern commercial conditions expect it to satisfy. I understand that the change over which is taking place at the moment is one of the greatest feats which have so far been accomplished in the history of automatic telephony as the whole body of subscribers within the Sheffield telephone area are being transferred at one operation and in the same instant of time."

The Lord Mayor expressed the thanks of all subscribers to the girls who had maintained the old service, and then continued : " In our impatient moments very few of us stopped to remember that every day they had to establish connexion between 180,000 subscribers on 90,000 different calls, and all the time they have done their best to satisfy everybody."

" If now and then they may have heard a nasty rude remark, we apologise, and will even go so far as to admit that the subscribers themselves were not always above making a mistake. Thank you again. Good-night and good-morning."

Four full and five Satellite Automatic Exchanges of the No. 16 type were installed by Messrs. Siemens Brothers as follows :—

Exchange Name.	Equipment. Pre-selectors.	Equipment. Final Selector Multiple.	Total working lines at transfer.
Sheffield (Full Automatic) ...	6,020	6,300	4,646
Beauchief " " ...	1,100	1,200	763
Broomhill " " ...	2,610	2,800	1,847
Sharrow " " ...	1,670	1,800	1,141
Attercliffe (Satellite)	940	1,000	661
Ecclesfield "	220	300	115
Oughtibridge "	50	100	44
Owlerton "	770	800	575
Woodhouse "	180	200	123
Sheffield Manual	—	—	13*
* 5 Rural Party Lines. 8 " Call Offices.		Total	9,928

The complexity of the " change-over " arrangements was increased by the necessity for transferring to their appropriate exchanges 564 subscribers' lines working on the Central Exchange.

The Manual Exchange is provided with :—

3 plug-ended order wire B positions (with key-sender impulse equipment).
3 jack-ended B positions.
1 Service P.B.X. position (for dealing with " 92 " level calls).
21 A positions (for calls from the " O " level selectors and call offices).
16 " enquiry " positions.
6 position " trunk record " desk.

The manual equipment and a suite of 22 trunk signalling positions are installed at the Head Post Office where the trunk switchroom was enlarged by removing a partition wall hitherto dividing it from the old phonogram room. A new phonogram room had already been provided in another part of the building and the new continuous panel phonogram equipment has been in use there for several months.

It may be of interest to note that with one exception all the exchanges involved in the scheme were of the magneto type, and it will be appreciated that the " life-long " habit of calling the exchange by ringing *before* lifting the receiver would have resulted in subscribers " dialling " *before* lifting the receiver if the point had not been stressed on every possible occasion by the " instructional " staff, in the " Press " and on the " wireless."

During the five weeks preceding the transfer an " instructional " staff of 46 officers was employed in visiting subscribers for the purpose of explaining the new procedure, and demonstrating the various " tones."

These officers made 13,352 visits to subscribers and in addition visited all the call offices in the area.

Apart from junctions to the third selectors at the automatic exchanges and circuits to and from the phonogram equipment, there were 297 trunks and junctions to be transferred from the Central Exchange to the new Manual Exchange.

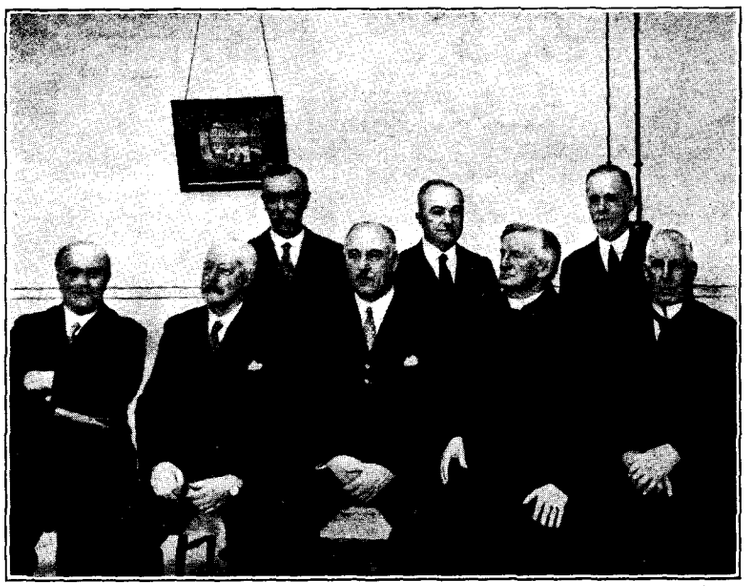
These were divided into two sections, approximately 59% of which were transferred at 1 p.m. on the day of the transfer and the remainder at midnight.

All the trunks and junctions contained in the first section had been thoroughly tested under actual working conditions before 3 p.m. and were then used for "through" traffic for the remainder of the day. This advance transfer ensured a sufficient number of circuits to all exchanges for the Sunday morning traffic whilst the remainder of the circuits was being tested.

On the Thursday following the transfer a party headed by the Lord Mayor, and including the Bishop of Sheffield, the Master Cutler, members of the City Council, public officials, and others visited the new Automatic and Manual Exchanges where they were received by Mr. A. Sirett (Postmaster-Surveyor), Mr. E. Gomersall (Superintending Engineer), Mr. W. Allen (Assistant Superintending Engineer), Mr. S. C. Smith (District Manager) and Mr. W. Lomas (Sectional Engineer).

The Lord Mayor took the opportunity during the afternoon of originating a call to The Secretary, G.P.O. London, in which, after intimating that he was present at the head of a representative party, he said :—

"We are glad to have had the opportunity of seeing the marvellous mechanism of this new exchange, and feel greatly indebted to Mr. Gomersall, to the Postmaster and to the staff for explaining to us in such a clear and interesting way how it all works. As we are all very reasonable people in Sheffield and very responsive to courteous and considerate treatment, we are prepared to forget the irritation and inconvenience which we have experienced during the last two or three years, and I can assure you that we shall not be found wanting in appreciation of the generous enterprise with which your Department has now met our needs," added the Lord Mayor. "In the few days which have elapsed since I received the first call the commercial community has made ample test of the new installation, and, speaking generally, I have heard nothing but praise and satisfaction expressed."



VISIT OF CIVIC REPRESENTATIVES TO THE NEW SHEFFIELD AUTOMATIC EXCHANGE.

BACK ROW (left to right): Mr. W. Allan (*Assistant Superintending Engineer*), Mr. A. Sirett (*Postmaster-Surveyor*), and Mr. S. C. Smith (*District Manager*).

FRONT ROW (left to right): Mr. E. Gomersall (*Superintending Engineer*), Mr. D. Flather (Master Cutler), Alderman J. G. Graves (Lord Mayor of Sheffield), The Bishop of Sheffield, and Alderman C. H. Smith.

Mr. R. A. Dalzell, Director of Telegraphs and Telephones, at the General Post Office, London, replied: "On behalf of the Postmaster-General I thank the Lord Mayor for the kind words of appreciation of the new telephone service in Sheffield, which, I agree, has through unforeseen circumstances been long delayed. I hope that the improved facilities afforded by the automatic system will do much to assist the commercial life and welfare of the City of Sheffield, not only in its local relations, but in its relations with other cities both at home and abroad. You may rest assured that the officers of the Post Office will do all in their power to maintain the service in a high state of efficiency."

At the conclusion of the visit the Lord Mayor, expressing the thanks of the visitors for the hospitality extended, said the visit had been a very delightful experience, for it had increased their respect and admiration for that great department, and they would all feel friends with it for ever and ever. He thought the scheme of inviting bodies of citizens to see the working of public departments was a step in the right direction. It tended to increase our sense of civic pride. He was glad that the Corporation departments were doing something similar by broadcasting details of the services rendered by them. It provided welcome and interesting information and aroused in people an interest in their own civic affairs that should be encouraged in every way.

The Master Cutler also expressed thanks.

Mr. Sirett said that Mr. Gomersall and his staff had had a very anxious time, and the postal authorities were indebted to them for all they had done to bring the system successfully into operation. The Department would always welcome helpful criticism from the public because they were anxious to provide a service which would be for the benefit of all.

Mr. Gomersall said that Sheffield now had a system second to none in the country, and he hoped that the citizens would make extended use of it and so enable the authorities to increase the equipment.

Thanks was expressed by the Lord Mayor to lady members of the Postal staff who helped to entertain the party to tea.

The illustrations which accompany this article are reproduced by kind permission of The Sheffield Independent Press Limited.

PROGRESS OF THE TELEPHONE SYSTEM.

THE total number of stations working at Feb. 28, 1927, was 1,495,329, a net increase of 10,511 on the total at the end of the previous month. During February new stations numbered 18,640 and ceased stations 8,129.

The growth for the month is summarised below :—

	London.	Provinces.
Telephone Stations—		
Total at Feb. 28	526,952	968,377
Net increase for month	3,802	6,709
Residence Rate Installations		
Total	113,153	185,322
Net increase	1,612	1,955
Call Office Stations		
Total	4,711	17,082
Net increase	13	153
Kiosks—		
Total	447	2,489
Net increase	17	107
Rural Party Line Stations—		
Total	—	9,953
Net increase	—	—
Rural Railway Stations connected with Exchange System—		
Total	—	729
Net increase	—	3

The number of inland trunk calls dealt with during January —the latest statistics available—was 7,715,866, an increase of 772,189, or 11.1%, on the figure for the corresponding month last year.

Calls made to the Continent during January numbered 25,336, and from the Continent 17,755.

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

LONDON—Ambassador (Mayfair Relief Exchange), Wallington.

PROVINCES—Sheffield (automatic).

Attercliffe, Beauchief, Broomhill, Ecclesfield, Oughtibridge, Owlerton, Sharrow, Woodhouse. } Sub-exchanges.

And among the more important exchanges extended were :—

LONDON—Hendon, Ilford, Lee Green, Palmers Green, Ravensbourne, Colindale, Wimbledon.

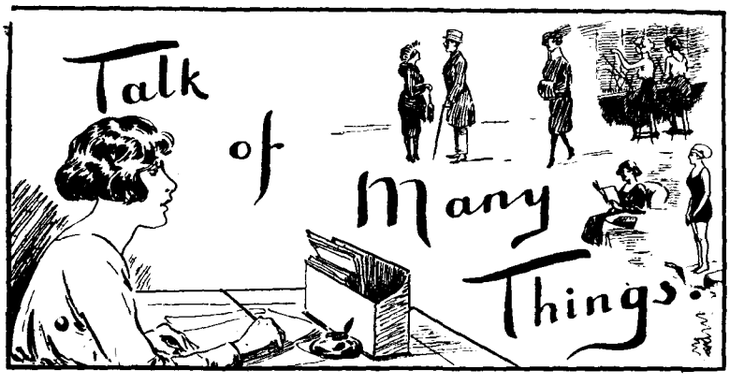
PROVINCES—Brentwood, Chatham, Heaton Moor, Jesmond, Whitefield, Leek, Newcastle (Staff), Northwich, Roundhay (automatic).

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

Birmingham—Redditch—Evesham,
Dewsbury—Wakefield,
Belfast—Carrickfergus,

while 109 new overhead trunk circuits were completed and 95 additional circuits were provided by means of spare wires in underground cables.

WE TELEPHONISTS



The Gentle Art of Fencing.

IN theory it is a fairly simple matter to put up a fence or to repair what was once a fence. All that is required is a small amount of wood, twice that amount of nails and a large number of spaces—double width—to place between the palings. I used to think that the man who neglected to keep his fence in repair was a sluggard and an untidy fellow, but I have since learned that such men are those who have reaped wisdom from experience. A little experience of fence-building or repairing goes much further than any amount of fencing and leaves one appreciative of the attitude of mind of the geographers who are content that the equator shall be an imaginary line running round the earth. Indeed, the equator type of fence would be ideal for my garden, for space is free and is available in unlimited quantities and material and labour are unnecessary. Such a fence is thus entirely economical and lasting. Be the gale never so strong, the fence falls not and neither will moth nor rust corrupt it.

The tangible fence, however—one that returns splinters for caresses—has its advantages. It serves as a boundary over which one's own garden *refuse may be thrown at appropriate moments; it serves as a support* for the elbows when commenting upon one's neighbour's efforts at horticulture, and it prevents his circus of dogs, cats, chickens and children from intruding upon one's estate and disturbing one's seclusion. It is useful also as a training ground for ramblers and loganberries—it were sacrilege to use the wireless pole for such base purposes.

After duly weighing the advantages of what I have called the "equator" type of fence and the continuous wooden fence, it will usually be found better to adopt a middle course and erect a fence composed of equal parts of wood and spaces. If your neighbour is stout and has only a St. Bernard dog and has no cats, chickens or children the spaces may be wider. The width of the spaces should be judged by eye and not by actual measurement of your neighbour's girth or of that of his dog. Such attention to detail is liable to be misunderstood and he might jump to false conclusions if, after the measurement, he saw you digging a perfectly innocent celery trench. In building or rebuilding the fence it will be found easy with a little manipulation to add a cubit to your garden at the expense of your neighbour's estate but care is needed and it is inadvisable to be too grasping. After all, an error in judgment is human and you can explain to him afterwards that in the matter of straight lines you are a disciple of Einstein.

Possibly from this you will have gathered that I have been building a fence. Oh, no! I have reaped wisdom where I have not sown and I am at present sitting on the garden-roller watching and marvelling at the labours of my neighbour, who declines to wait any longer for me to move in the matter. I have not been idle, however, I have indicated the line which the fence is to follow, I have offered to pay for the spaces and I am supplying plenty of advice. For encouragement I have lent him a history of the Great Wall of China, and I refer to him as Hadrian.

PERCY FLAGE.

The Simple Life.

I wonder if some of us fully realise the pleasure that is to be derived from exercising out powers of observation.

While on a short visit to Thorpe Bay recently, I was afforded much amusement from various sources.

To begin with, I was much taken with many of the gardens to be seen along the front, and also in some of the private roads. One especially took my fancy. It was a mass of daffodils, forget-me-nots, and wallflowers, and as a background, a lovely sloping rock garden. Every time I passed that garden, I simply feasted my eyes.

Another time my friend and I spent some time in a park—not a very large or a very grand sort of park at all, but extremely pleasant. There was a stretch of water upon which were floating swans, geese and other birds; and two delightful baby ducks—about the size of chicks just out of their shell—gave us a great deal of pleasure, with their quaint antics. I found myself murmuring:—

> "From troubles of the world I turn to ducks,
> Beautiful comical things—sleeping or curled,
> Their heads beneath white wings, by waters cool,
> Or finding curious things to eat in various mucks
> Beneath the pool. . . ."

Again, on the sea front we came across a merry little urchin who was amusing himself by sliding down the side of the stone steps leading to the beach, seated on a large piece of tin; as he slid down, he gave us such a merry smile—if he had been a Duke's son, he could not have been enjoying himself more—or, perchance, as much! It made us happy to look at him.

Truly the world is full of interest, and those who have learned to use their eyes need never be dull.

L. R.

Brixton.

It is thought that those who are interested in this page, and can recall the aspersions cast upon our liveliness at Brixton, may be delighted to hear that a very happy evening was spent by a large number of the staff on Tuesday, March 29, at the Raleigh Hall, Brixton. The fact that the position of M.C. was occupied by Mr. Raison helped to ensure success for the evening. We were all most enthusiastic, and another happy evening is anticipated in the near future. We trust that all who can will join us.

Queen's Hospital, Frognal, Sidcup.

The total of the weekly subscriptions in aid of the above hospital has been forwarded to the Secretary, Mr. Baker; i.e., September to December, 1926, £15—January to March, 1927, £6 12*s*. This is for the purpose of supplying hot-house fruits, and other delicacies, to the patients who are still confined to bed.

A. C. V.

Central.

THE LEARNERS' HOME.

They came from the suburbs in hundreds
These learners of each degree,
And they listened to working of others
Or worked quite awkwardly.
But there were some of the learners
Who could not join in the fray,
And our training supervisor
Watched o'er them day by day.
One she had given a test to
And oh, how she smiled to see
The total irregs. for that learner
Work out at two point three.
They came again from the homesteads
In one unending stream,
And the pale, pale face of each learner
Shone through her restless dream.
And the brainy girl and the slow girl
Passed merrily side by side,
For the ways of the school are narrow
But the gates of C—— are wide.
For the ways of the school are narrow,
But the gates of C—— are wide.

D. D.

Sydenham.

The last dance of the season, organised by the Tennis and Swimming Club Committees, was held on March 9, at Dartmouth Hall, Forest Hill. The evening was a great success, and all who attended spent a very pleasant and enjoyable evening. This completes the second successful winter season, and no doubt the renewed efforts of all will secure the future social reputation of Sydenham.

Now for the summer! Tennis Club members, roll up in your thousands. Swimmers, beware! Brixton is waking up!

G. M. T.

Ravensbourne.

"EXCELSIOR." A NEW VERSION.

The shades of night were falling fast,
As thro' the gloomy test room passed
A youth, who clad in strange attire
Had murmured as he mounted higher
"Order wires—no pilot."

His brow was sad and moist his eye,
He heaved a deep despairing sigh ;
And as he staggered to a seat,
They heard in accents low and sweet,
" Order wires—no pilot."

In happy homes he saw the light
Of household fires gleam warm and bright ;
Above no special pilot shone
And from his lips escaped a groan,
" Order wires—no pilot."

" O, bother the pilots," the super said,
And then her face went very red.
She too had heaved a mighty sigh,
Then heard that clarion voice reply,
" Order wires—no pilot."

Alas, alas, 'twas all in vain,
Those pilots would not come again.
He heard the pleasant last good-night,
Then feebly murmured up the height,
" Order wires—no pilot."

Here in the morning on the stairs,
They found him past all earthly cares ;
And as his eyelids closed in death,
He murmured with his last, low breath.
" Order wires—no pilot."

H. F. T.

Paddington.

TEN LITTLE GOLD PLUGS.

Ten little gold plugs all in a line,
One in the " Busy Back " then there were nine.
Nine little idle plugs solemnly did wait,
One up the " Multiple " then there were eight.
Eight little bright plugs, like sunbeams of heaven,
One on to " Fault Desk " then there were seven.
Seven little quiet plugs, one in a fix
One capped " out of order " then there were six.
Six little gay plugs, as bees in a hive,
Connected one to " T.T." then there were five.
Five little shining plugs, the quarter of a score,
One in the " Junction Test " and then there were four.
Four little straight plugs, docile as can be,
One through to " Supervisor " then there were three.
Three little coloured plugs, cords green and blue,
One in the " Holding " then there were two.
Two little comrade plugs sharing all the fun,
One joined the " Break-Jack " then there was one.
One little lonely plug, coming all undone,
Off came his little jacket, then there was none.

V. M. G. C.

City.

ODE TO THE NEW WAGES SHEETS.

O ! sheets of lines and shaded squares
Which bewilder as I clasp thee,
O sheets of pitfalls and of snares,
Never may I hope to grasp thee.

Thy face a maze of lines and spaces,
Of columns plain, and columns shaded ;
Thy virtues and thy subtle graces,
Inspire me not, but leave me jaded.

What thou givest that thou takest,
Thus an increase 'comes a decrease.
But that " Balance " that thou makest
Turns a decrease into increase.

So through long and tiresome stages,
Increase here, and decrease there,
We come to " Net amount of Wages,"
And at last are freed from care.

O ! sheets of lines and shaded squares,
With thine attendant forms and pages,
Thine advent brings ten thousand cares,
On all who deal with wages.

E. H.

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.

LONDON TELEPHONE SERVICE NOTES.

Accounts Branch.

THE month of May suggests cricket and the plans of the Accounts Branch Cricket Club are already well advanced. This club is one of the most juvenile of the Service clubs, as it did not come into existence until half-way through the 1926 cricket season. It, however, started off in life as a very healthy child with 31 active members and 57 honorary members and played 7 matches and 2 inter-club matches before the season was over. This season's fixtures already arranged are 6 matches at the Civil Service Sports Ground at Chiswick, one at the " Poly " ground at Chiswick and 13 at Battersea Park. Already 40 active members have announced their intention of joining for the 1927 season and a large number of honorary members are anticipated, so that if only the weather is kind the season should be a very successful one. The members are very keen.

The Controller is patron of the Club and Mr. J. Stirling and Mr. W. R. Bold, President and Vice-President respectively, while the principal officers are :—

Chairman	Mr. Hugh Williams.
Hon. Secretary and Treasurer	Mr. A. M. Hough.
Captain	Mr. C. E. Drabwell.

A further list of fixtures will appear in future issues of the *Telegraph and Telephone Journal*, and matches will be duly reported. It is hoped that the members of the staff interested in cricket will come along to the matches in large numbers.

* * * *

A number of the Headquarters Staff at Cornwall House celebrated April 1 with an informal dance in the Cornwall House Refreshment Club, and had a very enjoyable evening. This was the first occasion on which such a function has been held " at home," as it were, and the verdict of the 160 people who turned up was that the experiment was an unqualified success. The band was so tempting that dancers forgot that the floor was not exactly a professional one, and the caterers arranged matters in a way beyond all expectations. It is probable that this will not be the last event of this kind.

* * * *

The concert held on March 9 in aid of the Paddington Blind proved very successful. Community singing was one of the evening's specialities, while a sketch won much popular approval. The sum of £10 8*s*. 6*d*. was collected for the funds as a result.

* * * *

Obituary.

His colleagues in the Accounts Branch were shocked to learn of the death, with tragic suddenness, on March 23, of Mr. R. W. Mitchell, at the early age of 51. He had been at the office on the previous Saturday and passed away after only 3 days' illness.

Mr. Mitchell had spent practically the whole of his service attached to the Cashiers' Section, which he joined under the National Telephone Company on Aug. 6, 1904. He remained with the Cashiers on the combination of the two staffs after the transfer to the Post Office on Jan. 1, 1912, and had only been transferred to another section of the Accounts Branch a few months ago. He served with the infantry at Salonika and the East during the war, when he suffered from the diseases of that climate, and he has not enjoyed very good health since. His death from heart trouble was, however, quite unexpected.

* * * *

Contract Branch Notes.

The years 1920 to 1926 will probably be marked down in British industrial history as embracing one of the worst periods of trade depression. It is interesting to look back and see the phenomenal growth achieved by the London Telephone system during this period as indicated by the following figures :—

	Lines.	*Stations.*
January, 1920	168,049	308,135
January, 1927	310,488	519,969

It is not usually recognised that this growth was foreshadowed in the development study of London which was made in 1913. That study estimated that 275,910 lines would be working by January, 1921, but at the end of the war it was estimated that the attainment of this figure would be deferred to January, 1926, owing to conditions arising out of the war. It is significant that the number of lines working and on order actually reached this figure during January, 1926 !

The volume of work dealt with by the Contract Branch during the last financial year may be gauged from the following summary :—

	Financial Year 1925-26. (Stations.)	*Financial Year* 1926-27. (Stations.)
New business obtained ...	92,772	92,597
Ceasements	47,065	45,123
Net gain	45,707	47,474

The volume of gross new business obtained last year was appreciably reduced by the general strike and the prolonged industrial disputes as well as by a change in dealing with certain types of transfers, and it is satisfactory to note that the net gain shows a definite increase over that for the previous year, although the volume of new business obtained was slightly less.

The growth of residential lines continues to increase as the following figures indicate :—

	Financial Year 1925-26.		*Financial Year* 1926-27.	
	Installations.	*Stations.*	*Installations.*	*Stations.*
New Orders	24,158	28,855	26,634	32,459
Ceasements	8,377	10,185	9,202	11,313
Net gain ...	15,781	18,670	17,432	21,146

Efforts to introduce Kiosks along the Thames Embankment have at last met with some success, in spite of the difficulties put in our way by the authority concerned and arrangements are being made to instal four, one at the north end of Blackfriars Bridge, two in the front garden of Telephone House, and one in the front garden of the Institute of Electrical Engineers.

We can recommend the game of "Kiosking" to all lovers of sport, but we would give a warning that the game is a strenuous one and only super-sportsmen need apply. The game can be played anywhere throughout the country but there is far more sport to be had in towns.

We, in London, have our own set of rules governing the game which vary somewhat from those in force elsewhere. The players include, in addition to ourselves, local authorities of various descriptions, the Ministry of Transport the Metropolitan Police, frontagers, freeholders, leaseholders, and alleged frontagers, freeholders and leaseholders, &c. &c. &c. The play is always keen and frequently becomes involved in the traffic congestion of our too narrow and crooked thoroughfares, so that the winning of a point is quite an event.

Up to date we are 474 points up—at any rate we look at it in this light—and we console ourselves with the thought that our successes are visible to all men while our many failures are hidden away as quickly as possible in the registry.

* * * *

London Telephonists' Society.

The London Telephonists' Society held their final meeting of the current session at the City of London Y.M.C.A., 186, Aldersgate Street, E.C., on Friday, April 8, 1927.

The special feature of this meeting, which attracted a rather larger number of members than usual, was the reading of three prize papers by the successful competitors in the Society's Annual "Papers" Competition, and the distribution of the prizes by the Controller. Members of the Society are always glad to welcome Mr. Valentine to their meetings and greatly appreciate his willingness—year after year—to be present on these occasions.

The half-hour concert preceding the meeting was arranged by the staff of Thornton Heath Exchange, the items of which were exceedingly well rendered and well received. These short concerts have been very popular ever since their inauguration, and it is proposed to continue them next session. The Secretary will therefore be glad to be advised of any exchange willing to undertake the responsibility of providing the talent for one of these meetings.

At the termination of the music, Mr. Hinshelwood occupied the chair, and the following papers were read by the respective authors :—

"Recollections of a Junior Telephonist." Miss E. A. Chapman—Mayfair Exchange.

"Training of Staff." Miss C. K. Hooper—Paddington Exchange.

"Opening a New Exchange." Miss E. B. Jenkins—Maida Vale Exchange.

A short discussion followed each paper and all received many congratulations.

The Controller, rising to present the prizes, congratulated the Society on its activities during the past session and the very large membership which had been attained ; he also wished Miss R. James, the incoming President, every success in her year of office. Referring to the three papers which had been read, he congratulated the authors, and said he though the papers might well be contemporary to each other, the first dealing, as it did, with the experiences and feelings of the new telephonist, the second, the opening of the new exchange, and the third with the more mature subject, the training of staff in the many phases of exchange work. Mr. Valentine then handed the cheques to the lucky ones with a kindly word to each.

Before the meeting closed votes of thanks were enthusiastically accorded to the Controller for his kindness and to Mr. Hinshelwood, the retiring President.

* * * *

The Telephone Play.

The joyous anticipations of last month's *Journal* were fully realised on March 28 last, when Miss McMillan's Telephone Play, "Nothing Like the Truth," was presented for the second time at St. George's Hall, Caroline Street, Tottenham Court Road. Again, a crowded audience bore witness by its enthusiasm alike to the popularity of the musical play as a form of entertainment and to the skill and resource of the author in providing for the third year in succession a bright and humorous play dealing with the work of the Telephonist.

The performance "went with a swing" from first to last, and both principals, chorus, and orchestra added to their laurels. So much so was this the case that it is difficult to particularise ; but special mention should be made of the outstandingly brilliant singing of Miss Blair Street, particularly perhaps in the scene with the Professor in the first act, where her work touched heights that called for more exacting roles.

The one disappointment of the evening was the absence of Miss Lilian Jones, whose very graceful solo dancing was a much appreciated feature of the first performance. The Fates, however, were kinder on this occasion to Mr. Cherry, whose additional stage effects worked admirably.

An interesting feature of the evening was the presentation to Miss McMillan and Mr. Pounds of a gold wristlet watch and case of cutlery respectively, as visible tokens of the appreciation of the London Telephonists' Society of the skill, time, and labour so freely given in providing a Telephone Play for three successive years. The presentation was made by the Controller in a happy speech, and suitably responded to by the recipients of the gifts, the audience being reminded that the idea of a Telephone Musical Play, which had given such pleasure to members of the Society, actually originated with Mr. Valentine.

PERSONALIA.

LONDON TELEPHONE SERVICE.

Promotions :—

Miss E. M. MELDRUM to be Assistant Supervisor, Class I at Hop.

Resignations for Marriage :—

Miss L. M. GODDARD, Telephonist, of Central Exchange.
Miss M. E. SELLS, Telephonist, of Riverside Exchange.
Miss D. LETT, Telephonist, of Riverside Exchange.
Miss E. M. PETO, Telephonist, of Museum Exchange
Miss C. E. M. LAYTON, Telephonist, of Museum Exchange.

"THE POST OFFICE ENGINEERS' JOURNAL."

WE congratulate our contemporary on its new format (a convenient quarto), its enlarged contents, and especially on the varied character of its April issue, which lies before us. The *P.O.E.E.J.* is always replete with matter interesting to the telegraph and telephone man, and this number has upwards of 90 large pages of excellent articles excellently illustrated. Amongst them we may single out "The C.C.I. Telegraphs, 1926" and "A Keyboard Perforator for Baudot Circuits," by Col. Booth ; an article on the power plant at Tandem and Holborn Automatic Exchanges, by P. B. Frost ; on the Amsterdam Traffic Office, by Dr. Maitland ; on the Pacific Cable Board's cable ; and on Submarine Insulation (this by R. R. Williams and A. R. Kemp) ; and on "Some Aspects of Electric Capacity of Telephone Cables," by A. Morris. The Transatlantic Telephone Service is fully dealt with by Col. Lee, R. V. Hansford, and C. A. Beer. We have no space to refer to these interesting articles in detail, but the titles will serve to show the scope of the ample contents of the *Journal*. The price is nevertheless unchanged and is still 1*s.* 6*d.*