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COMMONWEALTH OF AUSTRALIA.

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PARLIAMENTARY STANDING COMMITTEE ON
PUBLIC WORKS.

REPORT

TOGETHER WITH

MINUTES OF EVIDENCE

RELATING TO THE PROPOSED

ESTABLISHMENT OF AUTOMATIC TELEPHONE
EXCHANGES

AT

ALBION AND NEWMARKET, QUEENSLAND.

MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

Third Committee.

The Honorable HARRY GRIGGORY, M.P., Chairman.

Senate.

Senator Hattil Spencer Foll.*
 Senator George Henderson.†
 Senator John Newland, Vice-Chairman.‡
 Senator Edward Needham.§
 Senator William Plain.*

* Appointed 26th July, 1920.

† Resigned 2nd July, 1920.

‡ Chosen to be a member of the Senate, 20th June, 1920.

House of Representatives.

Melwyn Atkinson, Esquire, M.P.
 The Honorable Frederick William Bamford, M.P.
 George Hugh Mackay, Esquire, M.P.
 James Mathews, Esquire, M.P.
 Parker John Moloney, Esquire, M.P.

* Re-appointed 26th July, 1920.

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

AUTOMATIC TELEPHONE EXCHANGES, ALBION
AND NEWMARKET, QUEENSLAND.

REPORT.

The Parliamentary Standing Committee on Public Works, to which the House of Representatives referred for investigation and report the questions of the provision of Automatic Telephone Exchange Buildings and Equipment at Albion and Newmarket, Queensland, has the honour to report as follows:—

INTRODUCTORY.

1. During the years 1912-1913, a telephonic survey was made of the Brisbane metropolitan area and a Report submitted that the whole system had reached a stage at which it could no longer be extended on economical or satisfactory lines without an entire remodelling. It was represented that the present equipment is congested and, to a very great extent, obsolete and worn out.
2. As a result of this survey a definite plan of action was arrived at. It was decided that the existing equipment should be kept in use until it was either worn out or incapable of extension, and that when this point was reached any expansion or remodelling necessarily should be made by the addition or substitution of automatic equipment, which has, up to the present, not been adopted anywhere in Queensland. Since the Central Exchange equipment is more up-to-date and newer than the suburban, it was decided that the remodelling should commence in the suburbs.
3. Of the existing suburban Exchanges which it is proposed to convert to automatic working, Albion is said to call for the most urgent attention.

PRESENT PROPOSALS.

4. The present proposals are:—

Albion Exchange.—To erect a Telephone Exchange building on a site at the corner of New Sandgate and Oriol roads and Bell-street, which has been acquired by the Commonwealth, and to instal therein an automatic telephone switching system having an immediate equipment of 2,300 subscribers' lines, and an ultimate capacity of approximately 4,500 subscribers' lines; the proposed equipment being capable of extension to the ultimate capacity named.

Newmarket Exchange.—To erect a Telephone Exchange building on a site at the corner of Gaunt and Abuklea streets, which has been acquired by the Commonwealth, and to instal therein an automatic telephone switching system having an immediate equipment of 500 subscribers' lines and an ultimate capacity of approximately 1,000 subscribers' lines. The proposed equipment will be a satellite of Albion Exchange, and will be capable of extension to the ultimate capacity named.

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ALBION AND NEWMARKET (QUEENSLAND) AUTOMATIC TELEPHONE EXCHANGES.

LIST OF WITNESSES.

Becher, Edgar, Supervising Engineer, Postmaster-General's Department, Melbourne	748
Campbell, George Peter, Director of James Campbell and Sons, Brisbane, Queensland .. .. .	.. .. .
Dixon, Henry Alexander, Chief Mechanical Engineer, Department of Works and Railways, Melbourne .. .. .	.. .. .
Kennedy, Peter, State Engineer for Western Australia, Postmaster-General's Department, Perth .. .. .	.. .. .
King, William Myers, President of the Chamber of Commerce, Brisbane, Queensland .. .. .	.. .. .
Lloyd, Frederick Robert, ex-President of the Chamber of Commerce, Brisbane, Queensland .. .. .	.. .. .
Muir, James Campbell, Manager of Telephones for Western Australia, Postmaster-General's Department, Perth .. .. .	.. .. .
Murdoch, John Smith, Chief Architect, Department of Works and Railways, Melbourne .. .. .	.. .. .
Sutton, Joseph William, State Engineer for Queensland, Postmaster-General's Department, Brisbane .. .. .	.. .. .
Taylor, Charles, Member of Legislative Assembly of Queensland, Merchant, Brisbane .. .. .	.. .. .
Topleton, Henry Barkley, Deputy Postmaster-General for Queensland, Brisbane .. .. .	.. .. .

EXTRACT FROM VOTES AND PROCEEDINGS OF THE HOUSE OF REPRESENTATIVES.

No. 111 of 22ND NOVEMBER, 1920.

9. PUBLIC WORKS COMMITTEE—REFERENCE OF WORKS—ALBION AND NEWMARKET (QUEENSLAND) AUTOMATIC TELEPHONE EXCHANGES.—Mr. Groom moved, pursuant to notice, That, in accordance with the provisions of the Commonwealth Public Works Committee Act 1913-1914, the following works proposals be referred to the Parliamentary Standing Committee on Public Works for its investigation and report thereon, viz.:—Albion Automatic Telephone Exchange Building and Equipment; Newmarket—Automatic Telephone Exchange Building and Equipment.

Mr. Groom having laid upon the Table plans, &c., in connexion with the proposed works,

Question—put and passed.

ESTIMATED COST.

5. The estimated immediate cost of the works is set down at—

Building—Albion	£4,500
Newmarket	2,050
	£7,450
Air Conditioning Plant—Albion	£3,000
Newmarket	3,000
	6,000
Exchange Equipment, including that necessary at other Exchanges	61,054
Equipment for Subscribers' Premises	12,548
Line Plant (Conduit Cables and Aerial Lines)	1,797
Diversions	30
	£89,779

COMMITTEE'S INVESTIGATIONS.

6. The Committee visited the existing Telephone Exchange at Albion, and inspected the sites acquired for the proposed automatic Exchanges at Albion and Newmarket, and, as far as possible, familiarized itself with the district which would be served by the new Exchanges.

Albion and Newmarket are being treated as one proposal. At the present time Newmarket is embodied in the Albion Manual district, but it is proposed to subdivide it when the automatic working is adopted, for the reason that Newmarket is the centre of a growing district and the expensive cabling, which it is said would otherwise be required between Newmarket and Albion for subscribers' lines, could thus be avoided.

7. *Information from the United States of America.*—To fortify itself with information as to the latest development in regard to automatic telephones abroad, the Committee arranged through the Prime Minister's Department, for inquiries to be made of the Commissioner for Australia in New York, and ascertained that the Commonwealth is on right lines in following what is said to be a settled policy in the United States of supplementing manual Exchanges in large cities by adopting the latest type of automatic equipment. Although it is admitted that the cost of installation of automatic equipment is considerably more than that required to instal the manual system, yet the nature of the service and the lower annual cost is in favour of the automatic.

8. The Commissioner stated that with respect to the revenue derived from the different systems the anticipations were that per subscriber the net balance of revenue in favour of the automatic system would be from \$1 to \$10. Taking Sydney and Melbourne as having similar conditions to, say, Boston (population 770,000), he stated that the experts with whom he had been in consultation thought there would be a saving in favour of the automatic system in its working of about \$8 per subscriber on the Central Exchanges. In the case of Albion and Newmarket, the departmental officers estimate that the annual charges, including interest, depreciation, and working expenses for the new automatic Exchanges, will be £20,818, or £330 per annum less than under the manual system. In a small installation, it is not to be expected that there will be a considerable saving per subscriber, but it is suggested that every effort be made to obtain the financial advantage of the lower working costs claimed for the automatic system.

9. *Financial Aspect.*—According to the figures placed before the Committee, the financial aspect of the proposition may be summarized as follows:—

Cost of installation (including land purchased)	£90,043
Annual charges, including interest, maintenance, and working costs	20,818
Estimated revenue at date of alteration from manual to automatic	14,463
Estimated annual revenue after five years' installation	23,663

so that, in addition to replacing obsolete equipment, and giving a more efficient service, the new installation should, after five years, show a profit of a fraction over 3 per cent. on the cost of installation.

10. *Existing Premises and Equipment.*—The building at Albion is a wooden structure providing very poor accommodation for the equipment and staff, and would appear to be a very bad fire risk. The present telephone switchboard is of the magneto non-multiple type, and is represented to be quite out of date for a multi-exchange network like Brisbane and the suburban Exchanges.

11. *Proposed Buildings.*—The main buildings proposed for both Albion and Newmarket are single-storied structures of simple design, with brick walls and galvanized iron roofs.

At the rear of the Newmarket Exchange, however, is a building designed to accommodate the inspector, certain mechanics and linemen, and a bin store, which it is proposed shall be of wood with a galvanized iron roof. After hearing all the evidence in regard to this matter, the Committee is unanimously of opinion that the buildings as designed will meet requirements, but strongly recommends that the small building at the rear of the Newmarket Exchange be erected with brick walls instead of wood, as proposed.

12. *Sites.*—The new site at Albion, having a frontage of about 68 feet to Oriol-road by a depth of about 151 feet, was purchased in 1912 for the sum of £328. The original proposal was to erect on this area a two-storied building, the ground floor of which could be used as a post-office and the first floor for Telephone Exchange purposes.

13. Owing to the risk of fire, and the fact that, as one of the services developed the space devoted to the other would have to be enlarged to keep the building symmetrical, this proposal was abandoned in favour of constructing two separate single-storied buildings on the area.

14. In the course of its investigations, representations were made to the Committee that the area acquired is insufficient for this purpose, and a recommendation was made that an adjoining block comprising an area of 40 perches should be now acquired. This block and two houses erected thereon have been placed under offer for £1,500, and it is stated that if this property were acquired, the needs of the Department for postal and telephone requirements would be met for a period of 20 years.

15. As far as the Telephone Exchange is concerned, the Committee considers the block purchased admirably suited for the purpose and, as it was represented that its central position would mean a saving of at least £10,000 in respect of cable work, the Committee has no hesitation in recommending that the Exchange be erected thereon.

16. While it is possible that the location of the post-office in this vicinity may be convenient from a departmental point of view, it is, of course, not essential that the post-office and the automatic Telephone Exchange should be in the same vicinity, and, as the matter of the erection of a new post-office is not under reference to the Committee, it refrains from expressing any opinion as to the advisability of acquiring the extra area suggested, provided sufficient space will be left between the proposed Exchange buildings and the adjoining properties to obviate any fire risk.

17. The Newmarket site, comprising an area of 32 perches, was acquired in 1914 for the sum of £100. It is represented as being suitable for the purposes for which it is intended, and of sufficient area to meet requirements for many years.

18. Inquiries were made as to the necessity for the Exchange at Newmarket, and the Committee was informed that the establishment of Newmarket as a satellite Exchange to work through the Albion Exchange was dictated by reasons of economy. It was stated in evidence that the annual cost of equipment and building plus the mechanics' time, &c., are less than would be the annual cost of the extra cables, which otherwise would be required to give direct connexion with Albion.

Under these circumstances, the Committee is convinced that the needs of the district would be best met by the establishment of the satellite Exchange as proposed.

19. *Air Conditioning Plant.*—In view of the fact that an amount of £3,000 is required at each Exchange to provide air-conditioning plant, the Committee made particular inquiries as to the work this plant was designed to accomplish, and the necessity for its provision.

Evidence obtained showed that where the humidity of the atmosphere is more than 70 per cent. the effect upon the metals of the automatic equipment is bad, while the presence of dust has a detrimental effect upon the contacts. This plant, then, is designed to eliminate the dust in the atmosphere and control its temperature and humidity.

20. It was ascertained that in existing Exchanges, both automatic and manual, it has been found necessary to establish some more or less makeshift method of freeing the air in the Exchange of moisture, and that the absence of the plant now suggested might have a serious effect upon the efficiency of the system. In view of these circumstances, the Committee agrees that the expenditure in this direction is justified.

21. *Water Service.*—No provision appears to have been made for any special water service to cope with a possible outbreak of fire. The Committee is of opinion that this should be done, and that ample provision should be made for an efficient water supply for this purpose.

COMMITTEE'S RECOMMENDATIONS.

22. After a careful consideration of the evidence, the Committee is satisfied that the necessity exists for the automatic Telephone Exchanges at Albion and Newmarket as proposed, and recommends that their establishment be put in hand as early as possible.

H. Gregory
H. GREGORY,
Chairman.

Office of the Parliamentary Standing Committee on Public Works,
527 Collins-street, Melbourne, 9th May, 1921.

MINUTES OF EVIDENCE.

(Taken at Perth.)

TUESDAY, 1st FEBRUARY, 1921.

Present:

(SECTIONAL COMMITTEE.)

Mr. GREGORY, Chairman;

Senator Foll, | Mr. Mathews.

Senator Newland,

Peter Kennedy, State Engineer, Western Australia,
sworn and examined.

1. *To the Chairman.*—The Perth Automatic Telephone Exchange was brought into use about September, 1914. There was some little trouble at the inception of the system, as the subscribers were not used to the manipulation of the instrument, and also because of the fact that the calling rate from the cut-over was found to be greater than had been originally provided for; that is, the average rate at which each subscriber connected with the exchange originates calls. Each subscriber might for one year average six calls per day, and then some increase in business might raise the average in the following year to eight calls per day. It is quite obvious that the aggregate calls in the second year would require more facilities for their disposal. These were two reasons for the difficulty, and another reason was that certain modifications were necessary to meet the purely local requirements. I had little to do with the automatic exchange at the time of its actual institution, but I was specially placed in charge after the cut-over from the magneto to the automatic, at which time, as I say, some little trouble occurred. Certain changes and modifications were made, and about February, 1915, a very much improved service resulted. That improvement was maintained until 1916-17, when the difficulty in obtaining telephone parts and accessories generally became quite acute in consequence of war conditions. It was necessary for a short time to refuse connexion with additional subscribers, but that period was the shortest of any within the Commonwealth. We were able to start connecting again within about one month from the first refusal, and that is the only time since the inception of the system that we have had to refuse service. Instruments began to come to hand, and the necessary action was taken to increase the equipment. However, in consequence of the large call for automatic apparatus, not only in Australia, but in America, and other countries, there is difficulty in securing delivery of materials, and that difficulty will, no doubt, be experienced for some little time to come. There has also been great difficulty in getting telephone cables, iron pipes, and other material for the undergrounding of the wires, which generally follows the automatic telephone system, or any up-to-date telephone installation. The work at present in hand has been delayed to a considerable extent in consequence of the difficulty in obtaining telephone cables. These difficulties, however, are gradually being overcome, and considerable quantities of cable have been received during the last twelve months. The automatic equipment is on order, and the service generally compares favorably with that of any other capital city in the Commonwealth. Quite recently there was some congestion due to the resumption of work after the railway strike—quite a heavy and unexpected congestion. It is usual to expect heavy traffic, for instance, at Christmas time, but the congestion due to the large number of calls originated after the resumption of work, and extending for about eight days thereafter, was extraordinary. That congestion is now

shading off, and telephone conditions are becoming more normal. I think that very reasonable arguments can be advanced under almost any conditions, for the installation of automatic telephone services, which compare favorably in every way with manual equipments of whatever class. The expenditure on account of operating the Perth Telephone Exchange in 1915-16 was £25,098, as compared with £27,833 for 1914-15, showing a decrease of £2,735, or 9.82 per cent. In reading these figures, it must be remembered that our year is from June to June, and, as I have previously said, the exchange was cut over in September, 1914, so that the figures for 1914-15 for the automatic working are only for a portion of the year. At that time there would be about 3,000 subscribers, and the recorded figure for working expenses is £25,098, though I think that must refer to the whole of the telephone business, and not to the automatic alone. I should like to investigate the figure. I think there has been considerable saving in the working expenses since the introduction of the automatic system.

2. *To Senator Newland.*—Extra equipment is required to meet the growing demands, and action is already in train to get it. The exchange is now very nearly fully loaded, so that any congestion is readily felt.

(Taken at Perth.)

WEDNESDAY, 2nd FEBRUARY, 1921.

Present:

(SECTIONAL COMMITTEE.)

Mr. GREGORY, Chairman;

Senator Newland,

Mr. Mathews.

Senator Foll

James Campbell Muir, Manager of Telephones, Postmaster-General's Department, Western Australia, sworn and examined.

3. *To the Chairman.*—I am in charge of the commercial and traffic side of the Branch, and I have occupied the position for about thirteen years. When the automatic exchange was first established in September, 1914, there were, approximately, 3,000 subscribers, whereas to-day there are 4,097 lines connected. My management includes control of all country telephone exchanges and also the business side of the automatic exchange. I mean that we have to see to the agreements entered into with new subscribers, and to conduct the general business relations with the public on telephone matters. I also control the operating staff and branch exchanges such as Fremantle. My responsibility covers not only the automatic service in Perth, but also the Fremantle, Guildford, and other exchanges in the metropolitan area. The metropolitan service includes the Perth automatic, the Fremantle manual, and Cottesloe, Midland, Guildford, South Perth, and Cannington. The metropolitan service does not extend to Armidale, which is connected by the trunk line system. The metropolitan radius is 10 miles. Fremantle is 12 miles away, but the Postmaster-General, in order to include Fremantle in the network, regarded it as being within the radius. Under the accounting system, the costs can be dissected for each exchange. In my dealings with the public, I have not found that the automatic system is satisfactory at the present date. When the system was

first established, it was not satisfactory, but it was made so in February, 1915, when additional plant was added. For several years after that I regarded the service as being very satisfactory. The additional plant means additional mechanisms—switching apparatus. To-day, in my judgment, the demand on the plant is in excess of its capacity; in other words, the calling rate per subscriber is more than the plant is able to cope with. I do not find that the demand of each subscriber is greater in Perth than in other cities. The demand varies; in Perth it is less per subscriber than it is in Sydney or Melbourne. The system has grown as shown by the figures; that is to say, the number of subscribers has increased on the automatic exchange, and this means a heavier demand on the equipment. Then, again, since the Peace, the calling rate per subscriber has shown a marked increase. There has been a rapid growth of business in the metropolitan area, and that has imposed a greater strain on the automatic equipment. Had we been able to obtain additional equipment promptly, we could have met the increased demand, and the service to-day would have been satisfactory. I am not altogether satisfied that it only means now that we require an increased plant. For example, I am not altogether satisfied with the behaviour of the automatic exchange during slack hours. The principal difficulty experienced is that subscribers are unable to obtain the numbers they want; they become connected with various other people who are originating calls at the same moment during these periods of light traffic. Occasionally they get through the exchange, but obtain the wrong number. That, of course, is registered against the subscriber, but, according to our observations, the number of wrong calls registered against such subscribers is comparatively small. The public are under the impression that when they are making a call, and get connected with several people, all these calls are charged, but in 90 per cent. of such instances these calls are not recorded. It does occur, as you tell me has been the case in the Police Department, that people get, for instance, Guildford four or five times when they want Perth. That would be due, possibly, to a fault in the equipment, or to the congested conditions at that particular time. For example, if there are 100 switches to meet an instantaneous demand, and the demand goes up to 120, trouble is caused. I think we can have a good service if the plant is of sufficient size, and the maintenance is satisfactory, and, in my opinion, the automatic system is capable of giving a good service. I hold the opinion, however, that an up-to-date manual service, with thoroughly trained operators, will give a more reliable and satisfactory service. I would not suggest limiting the number of subscribers to an automatic system. My experience has not extended to large net works like that of New York, for instance, and, personally, I hardly feel qualified to give an opinion on the point. I understand, however, that in New York the automatic system is being extended with the ultimate intention of making it wholly automatic throughout the city. I have not had any opportunity of visiting other countries where the system is in use. As to the difference in cost between the manual and automatic systems, I may say that, prior to 1915, our accounting system would not permit of the costs of the net work—that is of every exchange in the metropolitan area—being dissected. So far as I can gather, we have no reliable data as to the costs of the old manual service, but for the purpose of comparing the manual with the automatic, I would suggest taking a modern central energy or common battery system, and an automatic system to-day of approximately the same capacity. I am speaking in regard to both efficiency, as far as the public is concerned, and of efficiency and economy in the Department. Mr. Hasketh, who four years ago said that the installation of the automatic was estimated to result in a saving of £1 per subscriber per annum, was a very competent

engineer, and I do not feel qualified to put my opinion against his; further, I have not sufficient information as to the costing of the two systems to give a fair reply. We endeavoured several years ago to obtain a proper financial statement showing the costing of both systems, but were unable to do so. I would suggest comparing the Windsor Exchange, Victoria, with the Perth Exchange. We employ principally girls on the manual exchange, and men for night duty. I was sent over to Adelaide by the Government to go through the exchange there, and I then regarded the service there as first class. We give the same facilities to our girls in the way of retiring rooms, and so forth, as are given in Adelaide, and I recommend that these conveniences should be provided, because it pays to consider the staff. Thinking that I might be asked about complaints from the public in connexion with the automatic exchange I have brought a few figures. These complaints represent one of the chief reasons for not regarding the service to-day as satisfactory. During last December, we received 9,122 complaints. We have a special staff to deal with complaints. Of course, the complaints might be somewhat heavier than in other months, because of the approach of Christmas. The number of complaints in December is larger than usual; they are not now quite at the same rate.

4. To Senator Newland.—December is the worst month, undoubtedly for complaints.

5. To the Chairman.—These complaints arise, I think, from the overloading of the system. Very many of the complaints are by subscribers who are under the impression they are charged for every false call they make. Under the manual system we carried on extensive observations and checks in order to see whether the girls were recording correctly, and we found the tendency was to under-record 5 per cent. to 7 per cent. I have read the report of Dr. Bell, who recently visited Australia. In that report he said that we, here, did very well; but we did not compare well with the United States; and went on to say that he was afraid that the low state of efficiency in this country, as compared with the United States, might be attributed to Government ownership. I do not think that there is carelessness or sloth on the part of those responsible for the efficiency of the plant. My personal opinion is that private ownership is more efficient than Government ownership. Governmental methods are more cumbersome, and necessarily so, because of the necessity for checks; and then the protection provisions of the Public Service Act makes it very difficult to get rid of inefficient officers. Such a matter as this latter would soon be settled by a private company. The automatic system has been improved during recent years. There were two additional units connected with the Perth Exchange last year, and the switching mechanisms are an improvement on those originally installed. I believe that Geelong was the first automatic system in Australia. I understand that with a new automatic exchange, we should get a more up-to-date plant than before. I believe the later plants are regarded as more efficient. However, I have had no experience of them, except in connexion with the small additions we have made here. The same company is supplying the later plant. I think the American Western Electrical Company have a very good system, but I have no practical knowledge of it. Atmospheric conditions affect only the plant itself at the exchange, but we take counteracting measure. The atmosphere is dried by means of radiators, so that its effect is not very appreciable. The automatic system is more affected by atmospheric conditions than is the manual system, and, I should say, is more likely to be out of order. In the manual system, the switchboard is practically unaffected by atmospheric changes. We have means of meeting the effects of heavy electrical disturbances. All the parts of the plant are amply protected by lead coils and fuses to guard against the effect of lightning, just as in the manual system. If

there were a sudden growth of business, and it was the intention to erect a new exchange, I would, in the light of my experience here, and from my knowledge of the efficiency of the system in Adelaide, prefer a modern manual system. There are a number of reasons for and against this view. The automatic system possesses merits which the manual system does not; but I think a thoroughly efficient manual service would better please the subscribers. The capital cost of the manual service will be, I think, considerably less than the automatic, but this would be under the manual system will be considerably higher. In the absence of definite figures, I am hardly prepared to say which will be the cheapest and most economical in the end.

6. To Mr. Mathews.—During certain hours of the day, we are now carrying a full load. Roughly, we have forty vacant numbers, beyond which we cannot go. When we were working under the manual systems, it was an obsolete system—one of the most out-of-date that could possibly exist—and the service was very bad, and the complaints numerous. But I should say that, as between the common battery system and the automatic, the complaints would be far in excess with the latter. I visited the Geelong Exchange in 1913, and was shown statistics respecting the number of faults in equipment in connexion with it. I do not think they are anything like so high as we have here. I think the troubles we have in Perth to-day would still be experienced under a different automatic system. I do not think the troubles are peculiar to defects in the system, but principally due to fault of equipment. The position is that the demand is underestimated and the machinery is not big enough for Perth. It has not been underestimated, except at the initial stage. The Department for some time past has seen to the necessity of adding to the equipment, but there have been difficulties in obtaining it from America. When that equipment is obtained, I hope the defects will disappear, or will not be worth living. I look forward with confidence to a really improved system, and I will put more equipment in. I do not think it was false economy that brought about the deficiency. The Department and Government would be quite willing to expend the necessary money, but I am not in a position to know fully the reasons which obtained with regard to the whole position. We have placed our requirements before the Department, and all I know is the non-receipt of the additional plant, and the difficulty in obtaining it. If the Government supply us with the machinery we ask for, I feel confident the defects will be remedied. As to the congestion, I wish to make myself clear. If there are fifty switches to meet the demand, and you have sixty subscribers making simultaneous calls, something must happen. There is no trouble whatever in increasing the switches. The automatic company installed the automatic system with the assistance of some of our mechanics; their supervising engineers were here. I think they also installed the Geelong system. The conditions of the contract for the installation were, I believe, satisfactorily met. While we have room for forty more subscribers, we are overloaded, but if the machinery were provided, the complaints would cease.

7. To Senator Fall.—I am in no way prejudiced against the automatic system, but have an open mind on the subject. I would prefer the automatic if it would fulfil all that I think a modern manual system would fulfil. For example, the automatic system does not care for the subscriber who finds his number engaged, whereas a manual service does, with a thoroughly trained staff. On the other hand, the automatic has virtues which the manual has not. With the automatic you get a quicker answer, and you get quickly disconnected. I am far from wishing to convey that automatic telephony generally is not a good thing. My own opinion is merely that there is a slight balance in favour of an up-to-date modern manual service.

For several years the automatic system gave us a first-class service, but the demand on it was then within its capacity.

8. To the Chairman.—It is proposed to extend the telephone system by the erection of an exchange at Cottesloe, and I believe the Department will recon- sider the automatic system. I have had nothing to do with collecting the data for that work.

The witness withdrew.

Albert Edward King, Public Accountant, and Secretary of the Chamber of Commerce, Perth, sworn and examined.

9. To the Chairman.—It is about three years since I became secretary to the Chamber of Commerce, and, prior to that, I was a member, holding various offices up to that of Vice-President. During the whole of that time, I do not remember ever hearing the question raised of the provision of telephone communication with Kalgoorlie. Certainly, of late years, the matter has never been discussed. Business men may have talked of it amongst themselves, but it has never been on the agenda paper of the chamber for the last thirteen years. My own opinion is that the automatic is absolutely the best telephone system. I have ever come across, though I admit my experience is not great. We have the automatic system in Perth, and the manual at nine other stations, and I think I can say without exaggeration that I can ring up a dozen people in Perth for one on the manual. The advantage of the automatic is that you get a reply at once, or there is something wrong with the line, and this occurs only occasionally. With the manual, you may ring two or three times, and then wait and ring up again. I regard the Fremantle Exchange as absolutely the worst, and I would rather ring up twenty people in Perth than one there. The trouble is to get your party, and the next is to hear him. With regard to Cottesloe, I think the trouble is that we have not sufficient trunk lines. Often if I ring during the afternoon, I cannot get the people I want, and I am ringing up, not so much business places as private residents. I often get the reply from the exchange, "Lines engaged, try again." I do so; and sometimes I have to do it four or five times. I have been five or six minutes getting through to Cottesloe, and, as I say, it would seem that there are not sufficient trunk lines. Perth is wholly automatic; occasionally we have a little bit of trouble, and, in many cases, the cause is the subscribers themselves. I met the engineer who installed the Perth system, and I went over it with him, and ascertained the principle. I can now tell by the second ring whether I am going to get the party I want or not. You may wish to ring up twenty people, and get ten of them, when the machine refuses to work. The thing to do then is to hang up, and give the wire breathing time. On the whole, I think the automatic is worth fifty of the manual. Occasionally I find when I ring up somebody in Perth, I strike Guildford or Fremantle, perhaps once in fifty or sixty calls. Some days we get it continuously, and know that there is one wire wrong somewhere. But if a little patience is used, I think the faults are few and far between compared with the blessings of the automatic. You may say what you like about the automatic, but if you take it away there will be the biggest howl all round. I should take the business of the metropolitan area as being normal for a nation of this sort. I have rung up fifty people off the reel, and got thirty without any trouble. When I have rung up the fifty, I have had forty-eight. There is a committee of twelve for the Chamber of Commerce, and I often have to call them up for a special meeting in the afternoon. I do not say that I am a very big subscriber, but I may want thirty or forty people, and I want them at once. It simply could not do with the manual system. It would take my clerk all day long to do what I do

in half-an-hour. I would recommend the automatic well administered and controlled, as a splendid instrument, and I suggest that it should be put into all the present manual exchanges. In the early days of the automatic there was some trouble owing to the unfamiliarity of the people with it. They thought it was the simplest thing to work, and so it is if it is done properly; but, if a mistake is made, it will not work. With a little experience, I can tell whether there is a prospect of my being through or not, and if it is not, I give the wire, as I say, a little breathing time. I have had no complaints from business people in regard to the automatic, with one exception. In that case the complaint was that the Department had charged for many calls that were not effective, and the Department very often gave a rebate. My experience is that the calls are fairly charged for. If you are charged with 500, the probabilities are that the effective calls are well over 450. People with several lines are just as well served as I am.

10. *To Mr. Mathews.*—I have had no experience with the common battery system, except in trying to get people from this end. In many cases, it is the fault of the caller—sheer carelessness—if he gets on to the wrong line. Soon after the installation of the automatic, there were not sufficient wires to carry all the messages. I am not certain whether there are enough trunk lines to Fremantle and to Cottesloe; my trouble is to get a reply, and then to hear the conversation. In my opinion, we have not sufficient trunk lines between here and Cottesloe, and I find great difficulty in getting my own house, sometimes having to ring seven or eight times. I do not say this shortage is due to false economy. I believe that, but for the war, we would have double the lines now, and we must face the position sooner or later. When there is any trouble I put it down, not to the automatic, but to the want of trunk lines, or something of that kind. I am emphatic in my opinion that the automatic is immeasurably superior under any circumstances.

(Taken at Brisbane.)

MONDAY, 7TH MARCH, 1921.

Present:

Senator NEWLAND, in the Chair;	
Senator Foll,	Mr. Mackay,
Senator Plain,	Mr. Mathews,
Mr. Atkinson,	Mr. Parker Moloney.
Mr. Bamford,	

Henry Barkley Templeton, Deputy Postmaster-General, Queensland, sworn and examined.

11. *To Senator Newland.*—I am aware of the reference to the Committee of the proposal to construct automatic telephone exchanges at Albion and Newmarket. The establishment of automatic exchanges is a matter of Ministerial policy. The Department in Queensland merely gives effect to that policy, but my information is that it is considered that the automatic will give a better service than the manual system, and will be equally economical. There can be no doubt as to the necessity for this particular service. In my judgment it is absolutely essential at the earliest possible date to remove the Albion Telephone Exchange from its present location to the new site which the Department has purchased. The Newmarket Exchange will be merely a satellite of the Albion Exchange for economical working. The present post-office building at Albion, in which the exchange is housed, is not in a central position. It is old and dilapidated, and there is a grave risk of fire at any time. As a matter of fact, a few years since we had to erect at our cost of something like £100 a brick wall between our own and

the adjoining premises to minimize that risk. The proposal is to transfer the exchange to a new building to be erected at the junction of the Sandgate-road, Oriell-road, and Bell-street, or, as it is now called, Russell-street, with a view to better cater for the requirements of the district, and also to more economically cope with them. I am assured by the State engineer, who can give you information on the technical side of the subject, that by having the exchange at this new site, we shall save at least £10,000 in respect of cable work. The location of the present exchange in its time no doubt was the centre of the district, but the development in Clayfield, Hendra, Ascot, and Hamilton has been remarkable during the last ten years, and it is to these places that we have to look for our future telephone subscribers. The present Albion Exchange is about 2½ miles from the General Post Office. The new site will be nearly four miles away. We have no automatic telephones in Queensland, and I have had no actual experience of the working of the system; but I have seen its operation, and have had it explained to me in the Sydney General Post Office. Our present system appears to meet the requirements of Brisbane, but the engineer assures me that it has almost reached the breaking point. Under existing conditions we cannot cater for a large number of additional subscribers. The fundamental trouble is the lack of a proper telephone exchange in Brisbane. That controls the whole situation. We have had to refuse telephone connections and facilities only because of lack of material, but that is common throughout Australia. We have an exchange in Brisbane, but not in South Brisbane, which is a big district yet remaining to be dealt with, and the construction of a telephone exchange there will be referred to your Committee later on. South Brisbane is served at present from the Central Exchange. Complaints in regard to the conduct of business in the exchange are comparatively few. Our present exchange is not actually overloaded, but it will not be able to meet requirements much longer.

12. *To Mr. Bamford.*—The new exchange at Albion will not relieve the Central Exchange to any extent, but substantial relief will be given by the construction of the proposed South Brisbane Exchange. The Albion Exchange will cater for a district which is rapidly developing.

13. *To Senator Newland.*—The policy of the Department apparently is to cut out the manual system altogether in these districts. Our present telephone facilities, except in small country towns, where the installation of an automatic exchange would not be justified, will be entirely replaced by the automatic. In these two new installations we shall have the automatic system, but we shall continue to have the manual system operating in the Central Exchange at the General Post Office, until all are replaced by the automatic. That is the position in Sydney to-day. There has been a demand for consideration on the part of residents of South Brisbane. When I first came to Queensland, telephone subscribers there were suffering a serious injustice, inasmuch as they were being charged rental for the full length of their lines, which had to come over the Victoria Bridge. Some years later, I had that injustice removed, and they were charged on the radial lines. There are places such as Corinda and Sherwood, which have to be connected with Toowong. We propose to have an automatic exchange at Sherwood, so as to relieve Toowong, and give the people a local service, which will be cheaper. Sherwood is about 7 miles from Brisbane, and has developed considerably of late years. Speaking from memory, there are about 1,000, all told, in the State, who are waiting to be joined up with our telephone system, but whose applications we cannot comply with, because of the lack of material. Residents of Home Hill are continually asking for telephone connexion, but, as we have no material, we cannot grant it. The soldiers' settlements are pressing, not for exchanges, but for trunk lines, and

these we are providing as far as possible. The new automatic exchange at Albion will provide at once for 2,300 subscribers, and will ultimately be extended to 4,500 subscribers. At the present time, we have 2,300 on the exchange, and we think that the proposed increase will meet requirements for at least the next ten years. These figures are based on surveys made by engineering officers. I am more optimistic, because I am familiar with the district, and know that it is developing. Having regard to requirements of fifteen or twenty years hence, I think we might reasonably provide room for a great number. Hamilton will develop considerably, especially if the State Government proceeds with the proposal to use it for wharf business. If that is done, it must necessarily produce a greatly increased business. The Department would be safe in providing room for more than 4,000 subscribers at the Albion Exchange. The Newmarket Exchange will simply be an aid to that at Albion. It will serve local requirements, and ease the burden on the Albion Exchange. The population round the Newmarket site is rather sparse at present, but will develop. Local residents will be served by junction lines to the Albion Exchange. Expense will be saved in that way. Instead of wires being run direct from the premises of subscribers at Newmarket to the Albion Exchange, they will run to the Newmarket Exchange, where they will be connected with the exchange at Albion. That system is not likely to cause any delay to subscribers, except when the junction lines are overrun. Under the automatic system, subscribers are advised by a buzz that the lines are engaged. The Department, the Committee may rest assured, will provide sufficient junction lines to meet the requirements of the busiest hours of the day, although not necessarily the busiest moments. There may be occasional cases where the junction lines will be overrun, but they will be very few. The connexion between the two exchanges will be automatic. It is intended to provide equipment for 500 subscribers at Newmarket, and ultimately to increase that accommodation to 1,000. It is difficult to estimate what will be the development in the Newmarket district. So far it has been very slow, for various reasons, no doubt, being the wretched time-table on the Engerra railway line. It is quite possible that, with an improved time-table, the number of residents would be considerably increased, but population at present is not drifting as rapidly in that direction as in others. The accommodation for the staff at the present Albion Exchange building is not at all satisfactory. The postal and telephonic business was conducted in the one building, but I transferred the postal business to what was at that time used as the postmaster's residence, and so gave the telephone business the full benefit of the accommodation in the office. Notwithstanding that change, the accommodation is still unsatisfactory, both from the point of view of the employees and the public. There is no doubt that, but for the war, the exchange would have been removed to the proposed new site some time ago. The project has been under consideration for some time. The manual exchange system here is not quite as up to date as that of the other States. We have the magneto service, and that is not as economical as the common battery and other systems. The engineering officers have gone into the question of maintenance, and have shown that the cost of the automatic system will be an annual saving of about £518. The cost will be practically the same as before, but the advantage of the automatic system is that it eliminates the human element in operating. It will not necessarily involve a saving on salaries, since we shall have more mechanics than we now have. The expenditure on salaries may be less, but the cost of maintenance will be greater. The number of mechanics will be less than the number of telephonists now employed. Every additional subscriber means an increased revenue. Our telephone revenue in Queensland has developed wonderfully compared with what it was two or three years ago, when, for the first time, it exceeded the telegraph revenue.

14. *To Mr. Bamford.*—Each additional subscriber means increased revenue, but not necessarily an increased profit.

15. *To Senator Newland.*—The total annual charges in respect of Albion and Newmarket under the present system are £21,157, whereas under the automatic system it is estimated that they will amount to £20,818, a difference of £339. A number of people in the district are already waiting to be connected with the exchange. This extension will not mean an increase in the number of wires. There will be an immense saving in cable construction. The new site is towards Sandgate—from one-half to three-quarters of a mile further on. We shall have a three-way conduit at the new site, and when we first located it, the engineers told me we would save at least £10,000 in respect of cable construction. The new site has frontages to New Sandgate-road, Oriell-road, and Russell-street. It is not unsuitable, but it is insufficient in area. The matter was dealt with during my absence from Brisbane; but on my return it was referred to me by the Central Office. I inspected the site, with the result that I have put before the Central Office a proposal to purchase 10 perches immediately adjoining the site. On this additional block there are two houses, and it is under offer for £1,500. The engineers in the early stages did not know enough as to what our requirements were likely to be. The original proposal was to have a building in which the post-office business would be conducted on the ground floor, and the automatic exchange on the first floor. It was realized, however, that, owing to the risk of fire associated with an automatic exchange, that would not be a safe proposition. Another objection to the original proposal is that, as one of the services developed, we should have constantly to be adding to the space devoted to the other in order that the building might be symmetrical. The opinion now is that the automatic exchange should be in a separate building, and in order to carry out that scheme it will be essential to purchase the additional area to which I have referred. We could put up an automatic exchange on the 16 perches block, sell one of the houses for removal, and until we required the other could let it to the postmaster at a rental that would be equivalent to 15 per cent. on his salary. The proposition I put to the Central Administration was that the post-office is a constantly-going concern, and therefore dissimilar to a private business, so that we should not be restricted as to space to provide for our future requirements. We are going on all the time, and while we have the chance to acquire property at a low value, we should take advantage of it. After we acquire this site for a post-office building, the property will immediately appreciate in value. The property I have recommended for purchase backs on to the existing site. It faces Oriell-road.

16. *To Mr. Atkinson.*—With that addition, the site already acquired would not be insufficient. It would meet our requirements for the next twenty years.

17. *To Senator Newland.*—I do not know that it would be inadvisable so far as land is concerned to look even further ahead, but with the acquisition of the additional area as proposed by me our requirements for a long time ahead will be met. We could always build upwards. Land values in the district are appreciating almost daily. I have an offer in writing to sell this additional area to the Department for £1,500. One of the houses on it at the present time is let at 27s. 6d. per week. The land acquired for the Newmarket exchange is at the corner of Gaunt and Abuklea streets, and is sufficient for our purpose. There is not much development going on there, and if we required more we should be able to get it. The site consists of 32 perches of vacant land.

18. *To Mr. Atkinson.* With the acquisition of the additional land to which I have referred the Albion site would meet our requirements for the next thirty years. It would be unwise to look further ahead, since our money would be lying idle for very many years.

19. *To Mr. Mackay.*—The present Albion Post-office is on the Sandgate-road, and the site and building are the property of the Department. As far back as 1913, when it first became known that we contemplated removing that office, the local member introduced to me a deputation of residents in the vicinity, who protested against the proposed exchange; but I gave them no assurance with which they appeared to be satisfied. I pointed out that the site we had selected was practically the geographical centre of the district, and that it had the advantage of being a three-way conduit that would serve all the new developments. I assured them that if the post-office were removed, I would give them an allowance post-office in the present locality. I think such an offer should be at the Fiveways. I recently received a letter from you on the subject, and in reply informed you that my promise still held good. I understand that the chief objectors to the removal of the post-office in its present site are Messrs Campbell and Sons, but they would be better served with an allowance office at Fiveways. We shall undertake to provide telegraphic facilities at that office, but the messages may have to be transmitted from it by telephone. No one will be inconvenienced by the change. People residing in Gaythorne-road, Alice-street, and at the Breakfast Creek Bridge end will be catered for. An allowance office at Fiveways would be very central for them.

20. *To Senator Fox.*—This is an urgent matter. I am disposed to think that practically all the money allocated to the Department in Queensland at the present time is being spent in the country districts. We are doing practically nothing in Brisbane. The erection of the automatic exchange at Albion with a satellite exchange at Newmarket is urgently necessary, because we cannot at present cope with the development which is going on, and because also of the daily risk of the present building being destroyed by fire. In the event of such an occurrence, telephonic communication would be cut off for some years so far as the district was concerned. We cannot at present supply all telephone requirements. That inability is due to the shortage of metal, and is common throughout Australia. It will take us some time to secure the automatic apparatus. Tenders will be invited. Even if this projected work were approved by Parliament to-morrow, I do not suppose it would be possible to provide the automatic apparatus within less than three or four years. Meanwhile, we are incurring a very serious risk of fire at the Albion Exchange. Another important point is that we should not go on adding to the present sound, and thus increasing at the same time both the risk and the expense. The reason why so many applications to be connected with our telephone service are being held up at the present time is the difficulty of obtaining copper wire. We are getting supplies from the Port Kembla Company, but they are granted in their order of priority. We have not been able to import much wire lately, but we are importing cable. I do not know whether there is any special arrangement that our supplies of copper shall be obtained only from the Port Kembla Company. It was the difficulty of obtaining wire elsewhere, and the desire to encourage local industry, that led to the Minister negotiating with that company. I am sorry that wire obtained from abroad there we cannot obtain our full supply from the Port Kembla Company; but we have not imported any lately because the contractors are unable to supply it. In some cases, we have had to wait twelve months for cable, which is covered wire. I cannot say that we have been making an effort to get copper wire from overseas. I was away for the eighteen months prior to August last, and do not know what was done during that time. I can deal only with the present position. Since my return, it has been impossible to get wire from abroad, and we have been obtaining all our wire from the Port Kembla Company. We get an approval from the Central Office to invite tenders, and on receipt of tenders, I have power to accept one, except where a question of preference is involved. If, for instance, I

proposed to purchase United States of America wire, because it was substantially lower in price than British wire, I should have to submit the matter to the Central Office. I have not recently invited tenders for wire. We advise the Central Office every year what our requirements are, and the matter then becomes one for the Central Office. I know of no embargo on the purchase of wire from abroad. The engineering officers of the Department here say that the installation of an automatic exchange will result in a saving. They report that automatic telephone working, as compared with manual working gives the following advantages:—

- (1) Subscribers obtain inter-connection without intervention of operator.
- (2) Elimination of delays and errors inevitable in any system which depends upon the human factor for its operation.
- (3) Privacy of service.
- (4) Instantaneous advice if called subscriber engaged.
- (5) Instantaneous clearing on completion of call.
- (6) Lower working cost.
- (7) Increasing modern tendency towards substitution of mechanical devices for human labour and the general adoption of automatic equipment throughout the world.

21. *To Mr. Parker Moloney.*—The additional cost of maintenance will go a long way towards counteracting the savings in salaries effected by the installation of the automatic system. The automatic is a more delicate apparatus, and requires constant attention. I do not think it will mean any saving in the aggregate, because of the cost of working it. Estimates are always optimistic, and, in actual practice, do not always work out. My chief reason for supporting the change is that it is absolutely essential in the near future to have a new telephone exchange at Albion. I am not personally concerned with the question of whether the exchange should be worked automatically or manually, but I am not in a position to go against the opinions of professional officers, who are imbued with the view that the automatic is the proper system to adopt.

22. *To Mr. Mathews.*—The new site at Albion was purchased about 1912, or early in 1913. The money for this work has not yet been allocated. It has only just reached the stage at which it is ripe for reference to the Committee. The question of funds has had something to do with the delay that has taken place. Requirements in all the State which involve a large expenditure, in the absence of funds, have had to be delayed. There has been a relatively greater demand for increased telephone services in Queensland than there has been in Sydney. Our telephone development on the basis of population is greater than that of any other State. If I received an application for a new telephone which would have to be served by a cable, and there were no spares, I could not grant it. If it involved an aerial line in a country district, it might be granted, but we could not comply with the request so far as the city and suburbs are concerned.

23. *To Senator Newland.*—It is not usual for the Department to charge subscribers anything for the new equipment which the installation of the automatic in place of the Department's old equipment, it generally bears the cost. I will not say that the State engineer's estimate is rather on the optimistic side. On the 30th June, 1919, the annual revenue was £11,426, and he estimates that, on the 1st June, 1926, it will be £19,883. I do not think the engineers are optimistic in that respect, but they are sometimes optimistic in regard to the cost of providing a service. The revenue speaks for itself. The engineers also estimate that the number of lines connected with the exchange will have increased from 1,397 on 30th June, 1919, to 2,340 on 1st June, 1926. I am more optimistic than they are as to the probable increase. They are certainly on the safe side. I have seen the plans of the proposed new building. I was consulted in their preparation. They

were referred to me on my return to duty, and I am satisfied with the building for which the plans provide.

24. *To Mr. Bamford.*—Tenders for copper wire are not called in the case of the Port Kembla Company.

25. *To Mr. Parker Moloney.*—When the telephone system is converted from the manual to the automatic I do not know how we shall be able to place all our telephonists, unless they are prepared to go into country districts. Vacancies in country districts are always occurring, and if they desired to remain in the service they would either have to accept such vacancies or be provided for as female assistants in various directions. There is no definite proposal for their absorption. The matter so far has not been considered. The problem is not impossible of solution, but the girls as a rule object to go into the country. They would probably have the choice of taking a country position or resigning from the service. There is no danger of their being thrown out of employment provided they are prepared to take the positions that are made available to them. I am speaking now of only the telephonists in this State.

26. *To Senator Newland.*—The situation of the proposed new exchange at Albion is excellent from a working point of view. There has yet to be submitted to the Committee a proposal to erect an automatic exchange at South Brisbane. It is intended to establish exchanges later on at Paddington, South Brisbane, Bulimba, Toowong, and Yeronga, as you will see by a reference to the maps which I have put before the Committee. Sherwood is not shown on that map.

27. *To Mr. Mackay.*—The nearest official post-office to the proposed new site will be that at Nundah.

The witness withdrew.

Joseph William Sutton, State Engineer for Queensland, Postmaster-General's Department, sworn and examined.

28. *To Senator Newland.*—I have occupied my present position for nearly seven years. Prior to that I was Assistant Engineer in Queensland. I have been in the Department since 1897, and the whole of my service has been confined to Queensland. I am aware of the reference to the Committee in regard to the proposal to erect and equip automatic telephone exchanges at Albion and Newmarket, and have prepared the following statement on the subject:—

(1) The question of establishing an automatic telephone exchange at Albion can be better considered by briefly reviewing the position of the whole of the metropolitan system in the first place.

(2) The whole system has now reached the stage at which it can no longer be extended on economical or satisfactory lines without an entire remodelling; that is to say, it is congested and to a very great extent obsolete and worn out.

(3) In order to meet this condition of affairs which before the war it was anticipated would have to be faced a number of years earlier, a telephonic survey of the metropolitan area was made in the years 1912-13.

(4) As a result of this survey a definite plan of action was decided upon.

(5) It was decided that the existing equipment should be kept in use until it was either worn out or incapable of extension, and that when this point had been reached, all expansion beyond and any remodelling necessary would be met by the addition or substitution of automatic equipment, and that since the Central Exchange equipment was the more up to date and newer than the suburban the remodelling should commence in the suburbs.

(6) One of the chief reasons for the adoption of the policy for expansion by automatic and the ultimate conversion to automatic working throughout the metropolitan area was that the automatic system lends itself to a

more economical cable plant layout than does the manual, in that numerous exchanges may be scattered throughout the network, and the average length of the subscribers' lines thereby reduced without appreciably adding to the cost of apparatus.

(7) Thus the survey provided for several more exchanges than now exist with the manual system.

(8) The principal and most necessary of the automatic exchanges (other than Brisbane Central) provided for by the survey is South Brisbane, for the reason that its establishment will save considerable expense in connecting subscribers on the south side of the city with the Central Exchange over the only route by way of Victoria Bridge, which is circuitous and congested.

(9) Furthermore, the establishment of an additional exchange, in the South Brisbane area, will somewhat relieve congestion now existing on the Central manual switchboard. This switchboard has reached such a condition that action must be taken at once to relieve it if the position of being unable to connect further subscribers in the city area at the end of, say, next year is to be avoided.

(10) Thus it is obvious that the question of establishing an automatic exchange at South Brisbane is as important or even more important than the question of establishing an automatic exchange at Albion.

(11) Of the existing suburban exchanges it is proposed to convert to automatic working Albion calls for the most urgent attention, for the reasons quoted in a separate statement.

(12) It will be seen that Albion and Newmarket are treated as one proposal.

(13) At the present time Newmarket is embodied in the Albion manual district, but it is proposed to subdivide it when automatic working is adopted, for the reason that Newmarket is the centre of a growing district, and expensive cabling, which otherwise would be required between Newmarket and Albion, for subscribers' lines, can thus be avoided.

29. *To Mr. Mathews.*—We have only the one common battery system, and that is at the Central Exchange. In the other exchanges we have the magneto non-multiple system. Even the common battery system nowadays is obsolete.

30. *To Senator Newland.* The common battery system up to a certain point gives fairly general satisfaction to subscribers now connected with the exchange, but it is incapable of further expansion without an entire remodelling of the system. There are not many complaints on the part of subscribers. As a system it is alike of those in the other capitals. We have something like 700 applicants waiting to be connected up with the telephone system in the metropolitan area. Generally speaking, our inability to grant these applications is due to lack of material and funds during the war. Given funds and appliances, we could still connect up some subscribers with our present plant, and go on until we could put in the new system. That, at the outside, will be two years hence. The Albion and Newmarket exchanges will give no relief to the Central Exchange. That is why I say in my statement that the establishment of the South Brisbane Exchange is even more important than an automatic exchange at Albion, although the latter is undoubtedly exceedingly urgent. South Brisbane, however, must be placed first, and I do not know why it has not been submitted to the Committee before. I think the delay is owing to inquiries that are being made as to the acquisition of a somewhat larger site. South Brisbane is more important than Albion, because it will give some relief to the Central Exchange. We should be able at once to relieve Central of 2,000 subscribers by the establishment of South Brisbane Exchange. Trunk lines between exchanges are known by us as junctions. The Newmarket site is about 2 miles from that at Albion, but we

cannot separate the one from the other, since they constitute really one proposal. The automatic links itself is the splitting up of the system into small exchanges, and so the saving of initial costs by the using of junction lines. The erection of a satellite exchange at Newmarket will be more economical than would be the building of a larger exchange at Albion. It will be more economical from the very outset. The margin at first will be small, but it will grow larger every year. It is a question of the annual cost of the satellite exchange at Newmarket as against the annual cost of the only alternative which would be the provision of additional cables (underground conductors) for a distance of 2 miles. The proposals before the Committee are as follows:—

(a) *Albion Exchange*. To erect a telephone exchange building on a site at the corner of New Sand gate and Oriel roads and Bell Street (known now as Russell Street), which has been acquired by the Commonwealth, and to install therein an automatic telephone switching system having an immediate equipment of 2,000 subscribers' lines, and an ultimate capacity of approximately 4,500 subscribers' lines. The proposed equipment will be capable of extension to the ultimate capacity named.

(b) *Newmarket Exchange*. To erect a telephone exchange building on a site at the corner of Ganitt and Abuklea streets which has been acquired by the Commonwealth, and to install therein an automatic telephone switching system having an immediate equipment of 1,000 subscribers' lines and an ultimate capacity of approximately 1,000 subscribers' lines. The proposed equipment will be a satellite of Albion Exchange, and will be capable of extension to the ultimate capacity named. The financial aspect of this proposal has been included under Albion, because of its close relation thereto.

Reasons for the Proposed Albion and Newmarket Exchanges. These areas are at present served by Albion Exchange. Owing to the location of the present telephone exchange in Albion a considerable amount of wasteful expenditure is necessary on line plant which will be avoided if a telephone exchange be erected on the new site. The existing building is a wretched structure, and the fire risk is unduly high.

In the case of a telephone exchange we do not speak of fire risks in the ordinary sense. The danger is not so much the risk of fire spreading from another building as the liability of strong current being brought in by the numerous overhead wires covering the exchange from the network of telephone, electric light, and tram wires. There are many points of proximity between the two and there is always a liability of contact. That is particularly so in regard to high potential currents such as we have on our electric light wires. There is a great danger of that current being brought in and burning up an exchange. We endeavour, as far as possible, to prevent such damage by means of certain apparatus that we put in, but when the current coming to any or jumps from one point to another it is very difficult to deal with and there is always a danger of its getting beyond control. There have been such occurrences. From time to time exchanges like Saw mills are burned the same way. A fire line to the same case occurred also in the Sydney Exchange Cable Room. In my written statement regarding the present Albion Exchange I continue:

The accommodation for the equipment and staff is quite inadequate. The present telephone switch board is of the magnetic non-multiple type, and is quite out of date for a multiple exchange network like Brisbane and the suburban exchanges. The establishment of a satellite exchange at Newmarket will enable a more economical line plant to be provided

for the subscribers in that area, and better transmission will be given also.

Estimated Costs.—The estimated immediate cost of the works is:—

ALBION AND NEWMARKET.		
Sites (already acquired)—	£	£
Albion	164	
Newmarket	100	
		264
Buildings—		
Albion	4,000	
Newmarket	3,000	
		7,400
Air conditioning plants—		
Albion	3,000	
Newmarket	3,000	
		6,000
Exchange equipment, including that necessary at other exchanges	61,001	
Equipment for subscribers' premises	12,548	
Line plant (conductors, cables, and aerial lines)	1,797	
Diversions	30	
		£80,043

NOTE.—The cost of the Albion site was £298, but as a post-office will be built on the site only half the cost has been charged up to the automatic exchange proposal.

As to your inquiry in regard to the necessity of putting in an air-conditioning plant at Newmarket, which will cost as much as that to be put in the Albion Exchange, although the Newmarket centre is very much smaller, I may explain that the plant is necessary in both exchanges to preserve the continuity of the working of the apparatus. It gives better service under certain conditions of humidity and freedom from dust. We estimate that practically the same air-conditioning plant will be required in both exchanges. The following statement shows the revenue derived and the revenue which is estimated will be obtained on the date of transfer and with five years' development:—

Exchange	1912-13		Estimated on 1.1.14		Estimated on 1.1.15	
	Annual Revenue	Subscribers	Annual Revenue	Subscribers	Annual Revenue	Subscribers
Albion	£11,426	1,307	£23,326	1,904	£19,222	2,240
Newmarket	1,259	150	2,157	204	5,731	480

The alteration of the system will not involve any additional cost to subscribers so far as equipment is concerned. The sites were chosen before I took up my present position. Mr. Crawford, State Engineer, Sydney, was then Acting Engineer for Queensland, and submitted proposals to the central engineering staff, which approved of them. I have given the matter consideration, and am satisfied that it is an economical proposition to spread out the equipment, as we propose, in branch exchanges. Branch exchanges give the best results. That opinion is supported by what is being done in other places. I have here a standard work by Smith and Campbell—a recognised American authority—which was a guide to us at the time that the survey was made, and at page 386 the Committee will find a skeleton diagram of an automatic telephone system at Columbus, Ohio. The diagram shows the disposition of the central and other offices there, and it will be seen that the traffic network and branch exchanges cover the whole city. That is a typical layout in America.

31. *To Mr. Atkinson.*—It is still the system adopted there.

32. *To Senator Newland.*—In Brisbane we shall have for the most part branch exchanges, but a satellite exchange is one that works through a branch exchange in order to satisfy ourselves that it will be economical to have a satellite exchange at Newmarket and to make such calculations, and are satisfied that the annual cost of the equipment and building, plus the necessities' time and so forth, are less than would be the annual cost on the extra cables, which otherwise would be required to give direct connexion with Albion. I have had no practical experience of the working of an automatic exchange, since the automatic system has not yet been brought into operation here. The selection of these sites was made the subject of very careful study. A telephone survey has been made. In other words, our officers have been over the district, and have taken notes of its telephone possibilities. The location of every probable subscriber for a period of fifteen years, so far as can be judged, has been determined. I do not think that within the next fifteen years practically every householder will want a telephone in his home. Judging by what has taken place in other countries, I do not think we are likely to have such a demand. In making our calculations we are influenced, amongst other considerations, by the quality of houses in a particular survey. The nature of the business chiefly carried on, and the class of tenants or residents, are important design proposals will be sufficient to meet our requirements for the next fifteen years, unless any phenomenal development takes place. Should we get that development—and it might come as a result of shipping business going to the mouth of the river and large docks being formed in the Hamilton District—we shall be able to meet it by a satellite exchange in that particular area. It will be more economical to meet it in that way than by increasing the size of the Albion Exchange. The erection of other suggested telephone exchanges will not have any effect on the Albion Exchange. They will not divert lines that we expect to go to Albion, for the reason that we shall have a city area interposed between the proposed exchanges.

33. *To Mr. Bamford.*—A subscriber has no voice in the determination of the exchange with which he shall be connected, but it is the policy of the Department to connect up with the nearest exchange.

34. *To Senator Newland.*—I have seen the plans of the proposed building, and am satisfied that they will amply provide for the equipment and conveniences required. The Newmarket building is very satisfactory. I do not favour the plan for the Albion Exchange. The accommodation for employees, which is attached to the east side of the building, should be kept separate. It is very desirable that we should have a good light on this side of the building. There is a good light on the hall-house, should be where it is shown on the plan; it would be quite satisfactory if erected in the yard. We have a house on the additional block which it is proposed to acquire at Albion, and that house, if altered, would provide for the inspector's room, linemen's room, and luteless room. The air-conditioning plant could be housed in a small shed on the site. If that were done we should have better light and more flexibility. Natural daylight is far better than the artificial light which we will have to substitute for it if the plan now before the Committee is adhered to. The plans for the Newmarket building are quite suitable. There we have good natural lighting in three sides, but the Albion plan provides for lighting on only two sides.

35. *To Mr. Parker-McIntyre.*—I do not know the reason for the difference in these plans. We have had no voice in regard to them. We merely sent to the Central Office a sketch showing the floor area required by us. This plan was designed by the Works Department. It will not be necessary to acquire further land at Newmarket, but it would be wise to acquire, as suggested, an additional area adjoining the new site at Albion.

We should thus secure a wider frontage to Russell-street Apart from the employees' block on the east side of the main building for the Albion Exchange, I think that the plan is satisfactory, and would meet our requirements for the next fifteen years. The proposal to erect a post-office on the new Albion Exchange site will not interfere with our arrangements. From a technical point of view it is immaterial to us whether the post office be erected there or not. If we acquire the additional block we shall have plenty of room. It is not actually necessary that the post office should be associated with the exchange, but the site which we have chosen seems to me to be an ideal one for a post office. I have nothing to do with the purchase of copper wire or any other material. I merely state my requirements, and action is taken through the Central Office to obtain what wire I want. Smaller requirements are satisfied through the Comptroller of Stores. I understand it is the policy of the Central Office to place our orders for copper wire in Australia. According to the information I have just obtained by telephone from the secretary of the company, the City Electric Light authorities pay £175 12s. per ton for their conductors. That was the contract price for conductors obtained outside Australia a month ago, so that it would not seem that we are paying more for our wire than we should if we obtained supplies from abroad. We have allowed in our estimate £108 per ton, but I have ascertained this morning that we can get what we want from the Port Kembla Company for about £151. We based our estimates of the cost of this work on the prices ruling for copper three years ago. At that time the price ruling for commercial copper was £120 per ton. We thought we would have to be added to the cost of refining and drawing. I do not know of any copper wire having been imported of recent years for the use of the Department in Queensland. The copper we used by us has come from the Port Kembla Company and the cable from abroad. Having regard to the reduction in the price of copper, we ought to be able to say to get copper wire at a lower price than the estimate we have put in. Obviously, the cheapest policy is to call for tenders. The Electric Light Company and the Tramway Company purchase copper wire of the class we require for trunk lines. There might be a little difference, since they use standard copper wire as compared with single wire as used by us.

36. *To Mr. Mackay.* I regard the new site at Albion as the most suitable that could be chosen. A survey has shown it to be the telephonic centre, and as one who has a good general knowledge of the district I think it is the best that could be chosen, since it is at the intersection of a number of highways.

37. *To Mr. Mathews.*—It is the policy of the Department to encourage the satellite system of exchanges in connection with the automatic service. That policy was definitely laid down at the time of the survey made in this case in 1912 or 1913. If the Newmarket Exchange business grew to any considerable extent it might be advantageous to make it a branch exchange, but our survey shows that that is not likely to happen. If the Eagle Farm flats became a great manufacturing centre, we should erect a satellite exchange there. The satellite system lends itself to the automatic service. We do not have satellite exchanges except to a limited extent in connexion with the manual system. That is to say, under the manual system we endeavour to get junction lines between the whole of the exchange. I think the Department will continue the policy of establishing satellite exchanges. It is not necessary to provide for luncheon room at the Newmarket Exchange, except to comply with the provisions of the Postal Electricians' Award; but a bin store, as proposed, is necessary from the standpoint of economy. The line inspector's headquarters will be there, and if we had a store at Newmarket or not we should need to provide one at Albion. The main stores are at Montpellier-road, and we distribute by motor to the

bin or subsidiary stores from which the linesmen draw their supplies. Despite the fact that an air-conditioning plant, estimated to cost £3,000, will have to be put in at Newmarket, it will be more economical to have that satellite exchange than to serve the whole district from Albion. It will prove to be more economical from the very outset, and the economy so effected will grow year by year. It will also enable subscribers to be brought within the 2-mile radius, and thus to get the best rate. I am definitely of opinion that it will pay to have a satellite exchange at Newmarket. The establishment of a satellite exchange at Newmarket will save us £12,000 in respect of cables. Such an expenditure on cables to the Albion Exchange would ultimately be lost, because in the end it would be necessary to erect an exchange at Newmarket. I have here some figures prepared within the last few hours, showing the justification for the establishment of a satellite exchange at Newmarket.—

COMPARATIVE FINANCIAL SUMMARY SHOWING JUSTIFICATION FOR PROVISION OF AN AUTOMATIC EXCHANGE AT NEWMARKET, AS FROM 1ST JUNE, 1921.

Financial aspect upon assumption that—	Capital Cost new,	Capital Cost new and in situ,	Annual Working Expenses	Annual Charge.
	£	£	£	£
Accommodation is provided at Albion Exchange for Newmarket subscribers ..	23,077	38,640	1,409	4,235
An automatic exchange is established at Newmarket ..	19,397	34,900	1,230	4,140
Difference in favour of automatic exchange at Newmarket	3,680	3,680	179	05

The above figures include £12,540 for the purchase and laying of underground cable (in existing conduits), which will be unnecessary if an automatic exchange be established at Newmarket forthwith. As this cable would be thrown away on the establishment of an automatic exchange at Newmarket in, say, five years, and allowing a recoverable value of £1,190 thereon (one-seventh of valuation as a going concern), it would be necessary to write off assets valued at £12,540—1,190 =

£12,150 annually during the next five years. The total annual loss, therefore, if Newmarket subscribers are connected during the next five years to Albion is represented by £1,150 + 95, equals £2,245, and this amount would increase in subsequent years. If we connected those subscribers with Albion, the exchange building there would have to be larger, and additional facilities would have to be supplied. The figures show a difference at the outset of £95 per annum in favour of the establishment of a satellite exchange at Newmarket, but that saving would grow, and may run into thousands of pounds in the course of the life of the exchange. We shall at once save the cost of running out the cables from Albion. With a satellite exchange we can make connections between subscribers in the Newmarket District without coming into the Albion Exchange, and will thus save cables. There is a good deal of community of interest in the Newmarket District, and in such a district many people desire to communicate with each other over the telephone. The great bulk of the calls will be with Albion and Central. We have not had any practical experience of the automatic system in Queensland. We are treating it largely from a theoretical stand-point. The Central Office deal with the Works Department in regard to the preparation of plans, and we have written to Central Office, pointing out the desirableness of keeping entirely separate the employees' rooms shown on the plan for the Albion Exchange building. We are discussing the matter with them at the present time. We are providing for a

luncheon room at Albion, because the staff there will consist of one foreman mechanic, seven mechanics, and one junior mechanic, as well as a quarter-time cleaner. At Newmarket, where we have provided for a luncheon room, there will be only one senior mechanic and one mechanic. The lines staff will also be located at Albion. The one luncheon room will be sufficient for all these men. In a climate such as ours the linesmen would just as soon have their lunch in a shady spot, where they could get the air as in a luncheon room. No females will be employed at Newmarket.

38. *To Senator Roll.*—We have already acquired a site at Newmarket. The Albion site is in the telephonic centre of the district, and was acquired for that reason. Consideration was not given to other sites. The telephone survey was made by a Queensland officer, who was then the engineer in charge of the metropolitan section. He worked in conjunction with the electrical engineer, who at that time was Mr. Crawford, and it was on their joint recommendation that it was decided to adopt this system. I believe Mr. Hesketh, the late Chief Electrical Engineer for the Commonwealth, first promulgated the whole matter. He made inquiries on the spot, and it is because of the experience gained in the south, and in pursuance of the policy laid down after Mr. Hesketh's tour round the world in 1912, when he saw that the automatic was the coming system in America, that the automatic system is being adopted here.

39. *To Mr. Parker Moloney.*—We advised Central Office of our general requirements, and gave them a tentative lay-out. They have not followed our recommendation so far as the plans for the Albion Exchange are concerned, and we are pressing them to do so at the present moment in regard to the employees' block of rooms on the east side of the Albion Exchange building. These plans are by no means finalized. They cannot be until we know what system we are to adopt. The buildings have been designed for the Strouger automatic, about which we have more information than in regard to any other, but some other system might be adopted.

40. *To Senator Plain.*—It is due to lack of funds, first of all, that we are unable to comply with applications to be connected with our telephone system here. We have not been able to get all the money we require during the war-period, but given the necessary money we could buy whatever materials we wanted.

41. *To Mr. Atkinson.*—Branch exchanges will prove more economical than large centralized exchanges. With the manual system we endeavour to concentrate in one building, so as to have the whole staff under supervision. With the automatic that is not necessary, because the staff is comparatively small. District exchanges are cheaper than large centralized exchanges.

42. *To Mr. Mackay.*—I have used both imported and Australian copper wire. The Australian article gives complete satisfaction. It has to be in accordance with our standard specifications.

43. *To Senator Newland.*—A great deal of obsolete material will be scrapped as a result of the introduction of the automatic system. The whole of the equipment of the Central Exchange will be scrapped, but they are almost worn out. They were put in as far back as 1909, and their useful life is from twelve to fourteen years. The old material has a small residual value. We have allowed for that in our estimate. There are two houses on the additional allotment proposed to be acquired for the Albion Exchange. In one of those I think we might provide for the bin store, linesmen's quarters, and so forth. The other would be large enough to accommodate all the employees' rooms, and it would be necessary only to provide for an air-conditioning plant shed in the yard. This cottage would meet all the requirements in the matter of accommodation for the staff. That would represent a very considerable saving; it would mean that the rooms on the

east side of the main building as shown on the plan could be done away with. The introduction of the automatic system will do away almost entirely with female operators, but a number may be kept at the Central Exchange for trunk lines. There will be a distinct saving as between the salaries paid the mechanics and those paid to telephone operators. As the result of a former inquiry, it was set down that the saving would amount to more than £1 per line.

over the metropolitan area. The South Brisbane exchange will serve a very big district, and will be a very important development.

The witness withdrew.

George Peter Campbell, Director of James Campbell and Sons, Creek-street, Brisbane, sworn and examined.

47. *To Senator Newland.*—We and other business people in the vicinity have been objecting to the transfer of the Post and Telegraph Office from its present location to the corner of New Sandgate-road and Oriol-road, but if we are to have a branch post and telegraph office, our requirements will be met. My firm has the largest interests in the Albion. We have a gross turnover of about £245,000 a year, and if the present post and telegraph office there were removed to a site 14 miles away, endless confusion more particularly in regard to our telegraphic business, would result. It is of great importance that the post and telegraph office should be as close as possible to our factories, because a great deal of our business is done by telegraph. Even the present office is far enough away from us, but if it be removed to the corner of New Sandgate and Oriol roads, it will be quite out of the business centre. There are six different factories, all of considerable size, in the immediate neighbourhood of the existing office. Among these are a large saw-mill covering 74 acres of ground, and a pottery covering about 15 acres. I made representations to the Deputy Postmaster-General in 1914, and was promised that, in the event of the present post-office being removed to the site of the proposed new exchange, an allowance post-office would be opened in the neighbourhood of the present building. We are quite satisfied with the statement made to you yesterday by the Deputy Postmaster-General that that promise still holds good. The business people of Albion do not mind where the exchange is erected. We have great difficulty at the present time, however, in receiving attention. No doubt the telephone operators are doing their best for us under existing conditions, but there is room for very great improvement in the Albion Exchange. The telephone service there, having regard to the inadequate space, is very good, but it could be very much better.

(Taken at Brisbane.)

TUESDAY, 8TH MARCH, 1921.

Present:

Senator Newland, in the Chair;
 Senator Roll, Mr. Mackay,
 Senator Plain, Mr. Mathews,
 Mr. Atkinson, Mr. Parker Moloney,
 Mr. Binford,

William Myers King, President of the Brisbane Chamber of Commerce, sworn and examined.

44. *To Senator Newland.*—The telephone service of Brisbane is good, although it is not wholly satisfactory. We have considerable trouble with it at times; but we have heard that the same trouble is experienced in other States, and have settled down to a sense of relief that our disabilities are not as great as are experienced in some of the other State capitals. We understand that we are working under a very old system, however, and we think it is time an improvement was made.

45. *To Mr. Mackay.* I know that a number of applications to be connected with the telephone service in Brisbane have been held up, but this is attributed by the Department to shortage of material. Some people have had applications lodged with the Department for twelve months, and have not been able to get connected with the system.

The witness withdrew.

Frederick Robert Lloyd, ex-President of the Chamber of Commerce, sworn and examined.

46. *To Senator Newland.*—Our general telephone system here shows up exceedingly well as compared with that of some of the southern States. Mr. Webster, when Postmaster-General, did something which I have never known a Cabinet Minister to do. He sent an officer to the business people of the city to ascertain what they thought of the Post Office services, whether they were satisfied or dissatisfied with it—and I was very pleased to report to Captain Benjamin, the officer in question, that the telephone service was then really excellent. It is now more congested; but, on the whole, is very good. The Government, however, should look ahead. Brisbane is growing rapidly, and the opportunities which the General Post Office presents for an extension of the telephone service through the Central Exchange, which is located there, are exceedingly limited. There is every prospect of the present facilities being fully utilized immediately. I am very anxious to see steps taken to relieve the Central Exchange. I understand that it is proposed to erect an automatic exchange at South Brisbane, and that relief in that way will be secured. The plan which you have put before me shows that the Department are making provision for telephone extensions all

48. *To Mr. Mackay.* I am aware that the site at the corner of New Sandgate and Oriol roads was purchased a considerable time ago. We made representations to the Deputy Postmaster-General, and received from him an assurance that our interests would be protected. I have seen a letter sent through you by the Postmaster-General only a month ago, stating that the promise still holds good. We feel sure that it will be honoured; but we thought that the Committee would be able to override the proposal to remove the post-office from its present site. The new site is not suitable for the business people of Albion, who have a better claim for an official post office than have private citizens living in the neighbourhood of the new site. It is a mistake to remove the post and telegraph offices from its present situation, which is quite central enough to serve the business interests of the district. I should say that the telegraph business of our firm alone would be equal to the whole of that secured annually from residents of Clayfield. If, however, proper postal and telegraphic facilities are provided in the neighbourhood of the existing office buildings, we shall be satisfied. The new site is certainly a central one so far as the whole district is concerned; but it is not in the centre of the business section of the community. Regard should be paid, not only to the factories already established there, but to the likelihood of others being established.

49. *To Senator Foll.*—The site of the present post-office and exchange is too small, and I recognise that there is a danger of fire occurring there at any time. The building is really a ramshackle one. The business community of Albion will be satisfied if a post and telegraph office is erected in the centre of the shipping area

business part of the district. Our complaint relates only to the post and telegraph office. We do not care where the telephone exchange is put. The erection of a new post-office on the site of the existing building would be more satisfactory to the business people of Albion than would be the erection of a post-office on the new site. There is no reason why an allowance post-office should not be placed on the new site. It is the business end of the town which should be served by the official post-office.

The witness withdrew.

Charles Taylor, M.L.A., Grain and Produce Merchant, Roma-street, Brisbane, sworn and examined.

50. To Senator Newland.—I have not much to say with regard to the removal of the telephone exchange to the new site. I cannot understand why it is to be removed, unless the new site possesses certain advantages from the point of view of the Department's engineers, and will facilitate the work of the exchange.

I am aware that the site of the present Post and Telegraph Office, in which the exchange's also located, is small. Having examined the site put before the Committee, showing the further telephone extensions contemplated, I have no doubt that the new site will be satisfactory for the purposes of the exchange; but I urge that the Post and Telegraph Office should be rebuilt on the present site. The volume of business done by the office at the old site were retained would be enormously greater than it is ever likely to be if the office is removed to the new site. We have large mills and joinery works, as well as other factories in the neighbourhood of the present building, and the erection of a big blind factory is also contemplated there. The railway station is also close to it, and there are some forty shopkeepers in the immediate vicinity, whereas there are but half-a-dozen shops in the neighbourhood of the new site. An up-to-date post and telegraph office should be erected on the present Albion site. I do not know what is meant exactly by an "allowance office," but if it means an office opened as an adjunct to a store, or an office in charge of one person, it will absolutely fail to meet the requirements of the district. We have, it is true, Mr. Tomperton's promise that the present post and telegraph facilities will be maintained in the vicinity, but although he is in office to-day, he may be in some other State a month hence. We came before the Committee because we thought it would have authority to recommend the retention of the Post and Telegraph Office on the present site. It is not because of any feeling of chauvinism that we make this protest. In a matter of this kind, it is necessary that we should have regard to the best interests of the people to be served, and those of the Postal Department. If the Department set up an allowance post-office, and remove the official office to the new site, it will ultimately discover that an official post-office must be provided in the immediate neighbourhood of the old site. We have had a post-office on the present site for over thirty years, and there is no other official post-office within a mile and a half of it. The site itself is scarcely big enough. It might be necessary to secure a little more land; but the removal of the telephone exchange to the new site might enable the Department to give us all the facilities we require in the matter of the post and telegraph service on the existing site.

51. To Senator Foll.—There is vacant land in the vicinity of the Albion Post Office as well as other areas occupied by inexpensive buildings, which could be acquired by the Department as a site for a post and telegraph office.

52. To Senator Newland.—An allotment of 16 perches could probably be purchased in the neighbourhood to which I refer for £300. It might cost a little more. I do not think it would cost much less.

(Taken at Brisbane.)

FRIDAY, 11th MARCH, 1921.

Present:

Senator NEWLAND, in the Chair;	Mr. Mackay;
Senator FOLL,	Mr. Matthews;
Senator PLAIN,	Mr. Parker-Moloney;
Mr. Atkinson,	
Mr. Bamford,	

Henry Barkley Tomperton, Deputy Postmaster-General, Queensland, recalled and further examined.

53. To Senator Newland.—From the published report I gathered, that the evidence given by Mr. Campbell in regard to the proposed removal of the Albion Post and Telegraph Office to the new site at Oriol-road omitted such material facts, and was so likely to mislead the Committee that I thought it desirable to put the full details before you, so that you might have complete knowledge of the whole of the circumstances. In order to save time I have prepared the following memorandum:—

Proposed removal of Albion Post Office and Telephone Exchange from the present site to new site at the corner of New Sandgate and Oriol roads, Clayfield.—On the 17th December, 1913, a deputation, introduced by Mr. H. D. Macrossan, ex-M.L.A. (on behalf of the Federal member for the district), consisting of representatives of the Windsor Town Council and Progress Association, and Messrs. W. Lennon, ex-M.L.A., C. W. Campbell, and H. Bond, waited upon me respecting the proposal then afoot to remove the location of the Albion office to the position above referred to.

After hearing the statements made, I replied to the deputation in the following terms:—

"I am glad to have met you to-day, and to hear your view on this matter, but it is clear to me you are labouring under a delusion. I flatter myself the Department is more progressive than you are. The office is being removed to Oriol-road, and necessary facilities will be provided at other centres. I know the district well. What I am surprised at is the scarcity of the offices. No change of any importance can be made until this change takes place. You take the Town Council of Windsor. They have to travel to Albion to get necessary postal attention. I am of opinion that we must have a greater distribution of offices. The reason of the contemplated change is that the Department has gone to some expense to arrange to have a telephone survey with a view to giving an increased number of exchanges and also to place these exchanges in what are estimated to be the best centres in about fifteen years' time. If you take the Albion District or Clayfield District the whole aspect has changed within the last five years. Oriol-road has been largely built on. All our telephone business is coming in from Acot and Hamilton, and from a departmental view by having the office at Oriol-road some thousands of pounds will be saved. If we get an office at Oriol-road a three-way conduit will be provided, whereas by leaving the office at Albion this cannot be done except by incurring enormous expense. I am of opinion the present site is not central for the whole district to be served. It is inconvenient in many respects, hence the proposal to place it at Oriol-road. It is not advisable to have the telephone exchange in one centre and the post-office in another. I would like to disabuse your minds entirely of the idea that if this office is removed you will be without an office. You will have an increased number of offices in the district. The matter is not yet ripe for action. You will also realize the necessity for bringing the office to Oriol-road. The Clayfield office is to be removed, and Nundah likewise.

The revenue derived from the Albion office is about £1,500 per annum (local business). I would like to point out that the matter is not finally determined. You will recognize I have the public interests to study as well as the Department's, which are, after all, the public. If this office is removed to Oriol-road I will give you an allowance office in a suitable position at Albion. I will give you an office at Windsor. I think the time has arrived when the people of Windsor must be relieved of coming to Albion. The Department is looking well ahead. You can accept my assurance that the office is being removed you will not be deprived of any of your existing facilities; but, on the other hand, you will have better facilities provided." Whereupon Mr. Macrossan, who introduced the deputation, made the following remarks:—

"I think my suggestion regarding a deputation has certainly borne fruit, in view of the assurance to the deputation. I thank you very much on behalf of the deputation, and only hope that the removal will not in any way affect the residents of Windsor and Albion."

On the 12th January, 1921, James Campbell and Sons Limited wrote to Mr. G. H. Mackay, M.P., in the following terms:—

"We are given to understand that the post office at Albion is to be shifted to Oriol road, about 1 mile from here. We understand all that is going to be left at the present site of the post office is a pillar-box and place for selling stamps. This will mean we will have to go over a mile for all our mail, and also have to send that distance with all telegrams we want to send away. If this information is correct the business people at Albion would like you to use your influence to see if they cannot have a receiving office to take telegrams as well. It would be a great inconvenience for this busy centre to have to go to Oriol-road to despatch all telegrams. If necessary, we could get up a very big petition, asking for this request to be granted. I may mention that some few years back we interviewed the Deputy Postmaster-General on the matter, and the thing has been held in abeyance since; but we understand there is a movement on now to shift the post and telegraph office to the above-mentioned place. Your kind attention will oblige."

Mr. Mackay forwarded the communication to me, whereupon I informed him as follows:—

"With reference to your communication of the 15th January, enclosing a letter addressed to you by Messrs. James Campbell and Sons Limited, regarding the proposed removal of the Albion Post Office from its present position to a site at the corner of Oriol-road, I have to inform you that so far back as 1914 I gave an assurance to a deputation that when the postal business was transferred from the present location to the corner of Oriol-road, those residing in the vicinity of the present Albion Post Office would be satisfactorily catered for. That promise stands good, and it is inadvisable that Messrs. Campbell and Sons Limited should take notice of my report to the effect as mentioned by them, which do not emanate from this Department."

In view of the satisfaction expressed in 1913 regarding the promise made by me to provide facilities adjacent to the present site upon removal of the Department's official post-office to the new site, and the portion in italics of the above-quoted letter of 12th January, 1921, it is difficult to understand the attitude of James Campbell and Sons Limited in this matter. According to the press reports of Mr. Campbell's evidence, he stated that the new site is 11 miles away from the present site, whereas in his letter to Mr. Mackay above referred to, he gave the distance

as 1 mile. Correctly, it is between 1 and 7 miles. Mr. Campbell, after referring to the gross turnover of his firm's business (which has no relation to their postal transactions), stated that the removal of the post and telegraph office to a distant centre would cause great confusion in the telegraphic business of his firm; a great deal of their business was done by wire. I have caused the records to be searched, and find the following is the position:—

The number of telegrams transmitted from the Albion office during the three months ended 28th February, 1921, was 1,335, producing a revenue of £83 16s. 5d.

Of these, the number of messages lodged by James Campbell and Sons was fifty, on which charges amounting to £3 6s. 6d. were paid.

It will be seen from the foregoing that the proportion of telegrams lodged by James Campbell and Sons, and charges thereon, are about 3 1/2 per cent. only of the total transmitted from the Albion office and revenue therefor. Under such circumstances their business does not require or justify special consideration. It is observed also, in the evidence given by him as reported in the press, that Mr. Campbell stated that to have the Albion Post Office removed to the new site would be a distinct disadvantage to his firm, and he also stated that his firm would like the post and telegraph office as close as possible to its factories. Apart from the entire absence of justification, Mr. Campbell has to claim such special consideration in view of the small amount of business transacted by his firm (whose offices are in Creek street, Brisbane), I cannot help remarking that he has shown a selfish spirit in this matter, and apparently desires, purely in the interests of his firm, to entirely disregard the interests of the great body of the public, who also have to be studied by the Department in this respect.

It has been alleged by Mr. Campbell and Mr. Taylor that the present location of the Albion Post Office is the most suitable for providing for the business centre. In a large residential area such as Clayfield (the comparatively small business interests should not be allowed to operate to the detriment of the important interests of private individuals, who greatly outnumber the business element in the district. Apart from this, however, I desire to point out that there are more business places to be catered for beyond New Sandgate road than are at present located around the Albion office, as the following list will show:—

Marsden's timber mills,
Shop at corner of Riverton-street and New Sandgate-road,
St. Margaret's Day and Boarding School, in Lapraik-street, off New Sandgate-road,
Butcher's shop, between Butler and Russell streets,
Shop at corner of Oriol-road,
Shop near corner of Hill-street,
Laundry, grocer, butcher's, and provision shops, at and near the corner of Adelaide-street,
Grocer's shop in Adelaide-street, close to the New Sandgate-road,
Dr. Weeden, Dr. Healy, Drs. Murphy and Sutton, on the New Sandgate-road,
Savoy Pictures,
Presbyterian Boys' College, with large number of buildings on a considerable area of ground, Clayfield Kiosk (store),
Woods' grocery store,
Butcher's shop,
Cook's Pictures,
Commonwealth Savings Bank,
Newspaper, fruit, and refreshment shop,
Boot shop,
Chemist's shop,
Boot shop,

Grocer's shop, at corner of New Sandgate-road and Railway-parade,
Refreshment shop,
Ice factory
Blacksmith's shop,
Two stores,
Refreshment shops,
Butcher's shop,
Plumber's shop, and also
Hancock & Gore's timber yards at the Eagle Junction Railway Station.

Taking these two business areas into consideration, the site at the corner of New Sandgate and Oriel roads is an ideal spot to satisfactorily serve the interests of all concerned.

Moreover, I produce a map showing the postmen's deliveries in this particular district, from which it will be seen that the site above referred to is the geographical centre for such deliveries. Another feature that should be mentioned is that in determining these matters, consideration is to be given to the interests of the greater number of persons to be served. Further, the postmen's deliveries are the most important feature of the Albion office.

As stated by one of the witnesses, the Albion office has been in its present location for thirty-five years. It no doubt was a suitable position at that time, but during recent years the population has extended over several miles beyond the present-site, and the Albion office cannot any longer be reasonably or justly considered to be located in anything like either a central or suitable position for the economical and satisfactory performance of the Department's work from a postman's point of view.

The figures produced with regard to the business transacted by James Campbell and Sons indicate that they are not entitled to special consideration with regard to the location of the office, and as they claim to be large users of the service, the other business interests presumably would not be entitled to any greater consideration than Messrs. Campbell and Sons. There can be no doubt whatever that both the public and departmental requirements will be for many years to come absolutely and satisfactorily met by transferring the business to the new site acquired by the Department. Such site provides for ready access by convenient means to all districts and localities that will be served by the new office. The site at present occupied by the Department is the property of the Commonwealth. I have ascertained that the recorded values of the site and buildings as at the time of transfer of the Department to the Commonwealth on the 1st March, 1901, are as follows:—

Site	£200
Buildings	870
Total	£1,070

Upon transfer of the business to the new site, the existing site and buildings would be no longer required for departmental purposes, and I am of opinion they should be sold to the best advantage.

In my opinion the existing site would realize net less than £600 or £700, but the buildings would produce, if purchased at all, a very inconsiderable sum; the possibility is that the Department would have to demolish them and sell the material to the best advantage.

51. *To Mr. Bamford.*—The telephone revenue derived from Albion during the three months ended 28th February, 1921, was larger than that obtained during the first three months of the financial year. It embraced the Christmas holidays messages. I produce a map showing the postmen's delivery area. I wish to emphasize the fact that apart from the postal delivery in the Albion District, an allowance office would be sufficient to deal with all the business done there. The business would not impose a heavy burden on such an

office. I propose to supplement my statement by mentioning that the total revenue of the Albion Post Office for the financial year ended 30th June, 1920, was £1,864, of which £1,327 was derived from the sale of stamps and £293 from telegraphic business. Roughly speaking, one-fourth of the latter amount would be £73. The remaining items which make up the total of £1,864 are telephones, including trunk line telephones, £69; Money Order Branch, £31; Postal Note Branch, £15; and miscellaneous, which would cover Savings Bank business and the payment of pensions, £129. The number of money orders issued in that year was 888, while 1,634 money orders were paid. Having regard to these figures, I think it is reasonable to say that, taking away from this office the postmen's delivery, the business from a postal point of view is rather unimportant.

55. *To Mr. Mackay.*—An allowance office is conducted by a person not in the permanent employ of the Department. An official office, on the other hand, is conducted by a permanent official of the Department. An allowance office is paid by results.

56. *To Mr. Parker Moloney.*—Semi-official post-offices have practically disappeared.

57. *To Senator Newland.*—In the vicinity of the present Albion Post Office we shall establish an allowance office where the public will have all the facilities that it is possible for an allowance post-office to provide. These facilities will cover the receipt and delivery of telegrams, money order, and postal note business, a public telephone, the sale of stamps, and a receptacle for the posting of mail-matter. People in the vicinity will have practically all the facilities that they now enjoy at the Albion Post Office. The allowance office will be conducted in a shop or some other business premises until the revenue derived justifies an improvement in that respect. So far as Brisbane is concerned, I have not heard of any complaint on the part of people as to having to transact their business in an allowance post-office conducted in a shop where necessarily some of their business, especially that dealt with in telegraph messages, must come within the knowledge of the person conducting the office. In country places, however, there have been objections as between competing storekeepers. We have several allowance offices in the city of Brisbane. We have some on the south side of the river, and as far up as Corinda. As a general rule, allowance offices are conducted with the greatest satisfaction both to the Department and the public. There have, of course, been complaints. I had a recent case in the Rockhampton District, where a girl suggested that an allowance postmistress had divulged the contents of a certain telegram, but it transpired that the girl's own mother had disclosed the information. I have always found postmistresses or postmistresses highly respectful of any suggestion as to their having divulged information. You will gather from my memorandum that Mr. Campbell was quite under a misapprehension as to the facilities to be provided when he wrote to Mr. Mackay. The business premises in the vicinity of Oriel-road, a list of which I have put before the Committee, are more numerous than those in the vicinity of the present post-office site. There are only two large manufacturing interests in that neighbourhood, and they are both owned by Campbell and Sons. There has been some talk about a new factory for the manufacture of blinds, but it has not yet been established. I have not made any inquiries as to the suitability of the block of ground immediately behind the Oriel road site, and which at the present moment, although having an area of only 32 perches, would pretty well cost twice as much as we can pay for the 40 perches block. Exclusive of the building, it would cost more than the land adjoining the actual site. Judging by the price which is being asked for the next corner block, we would not get the 32 perches for less than £600. In my strongly of opinion, however, that we should not be circumscribed with respect to

space. The neighbouring houses are of a better type than those on the additional block I have suggested we should acquire. It is not absolutely necessary that the telephone exchange and the post-office should be combined, but it is most desirable, where space permits, to have your activities carried on side by side since such a system lends itself to better supervision. In my opinion, the purchase of the block adjacent to the new site would be a better business proposition than the purchase of the block at the rear, because it provides much more room for expansion and it is far more economical than the other proposal would eventually be. The important feature of the new site is that its situation means a very substantial saving in the expenditure on our cable work. If we had been called upon to give twice the amount we have paid for it it would still be a profitable proposition in so far as telephone exchange is concerned.

58. *To Mr. Mathews.*—The new site will be central also for the distribution of mails. The establishment of the post-office there will save time and expedite deliveries. The postmen who serve Ascot and Hamilton, as well as the Clayfield end of the area, will, as compared with one or two who go the other way, be nearer their deliveries, and will be able to get back quicker than they can at present. There is an allowance office at the Clayfield Railway Station. I had to establish it because of the distance from the Albion Post Office as now located. When the post-office goes to Oriel-road the allowance office at Clayfield Railway Station will disappear.

59. *To Mr. Mackay.*—The nearest official office to the new site is that at Nundah, which is about 2 miles distant. At the outset the allowance office at Albion will be established in a shop. We must ascertain the business to be done before we undertake to pay a person sufficient to induce him to devote himself solely to the business of that office. The public telephone there will be housed in a silent cabinet, and telegraph messages will be sent by telephone to an official post-office. We shall provide a cabinet to insure secrecy, and we always stipulate that those in charge of allowance offices shall not conduct their postal business over the ordinary shop counter. A separate part of the building must be devoted to postal work. Letters will be delivered by postmen from the official office, but letters to be called for may be sent to the allowance office. Should the business so increase as to warrant better arrangements we shall take action in that direction.

60. *To Senator Foll.*—In the list of business premises in the neighbourhood of the new site we have taken into account premises as far away as Junction-road. They are considerably nearer the new site than the Nundah Post Office. People at Junction-road will be able to go by tram at a cost of 1s. to the Oriel-road Post Office, whereas it is a long walk for them to the Nundah Post Office. We have absolute control over allowance offices in so far as the hours during which they shall remain open are concerned, except that the Railways Commissioner limits the hours of such offices when conducted at a railway station to seven hours per day, so as to avoid paying overtime rate under the award. The ordinary hours of an allowance office are from 9 a.m. to 6 p.m. I am convinced that an allowance office will cater for a long time for all the business offering at Albion. I go further, and say that, apart from the postmen's deliveries, the business is so small that it could be done by an allowance postmaster if he devoted all his time to it. The chief business is the sale of stamps. I do not think it would be better to continue the official post-office at Albion as at present and to establish an allowance office on the new site for the new exchange. That would neither be economical nor satisfactory, because the whole centre of the business in the district has absolutely altered during the last ten years. We have now to cater for people as far away as Kitchen-road and Zillman-road. The Oriel-road

site is nearer to them than is the present Albion Post Office.

61. *To Mr. Parker Moloney.*—In some cases, in order to save the employment of telegraphists, telegrams lodged in official offices are telephoned to the Central Office. That is done all round Brisbane in order to save the employment of telegraphists. So far as the transmission of telegrams are concerned, the people who have complained of the removal of the Albion Post Office to the new site will be as well off as they are now. We shall sell one of the two buildings on the Oriel-road site, and we propose to use the other as a postmaster's residence until we want it for other purposes. The building that I propose to sell for removal would probably bring from £200 to £250.

62. *To Senator Newland.*—The original proposal was that the post-office and the exchange building should be erected on the one block. It must be apparent to the Committee, as the result of its inspection, that that is impossible, hence my proposal to purchase the adjoining block in order that we may have adequate room. My view is that the post-office should be at the Oriel-road corner, which is close to a tram stopping place and convenient for postal purposes, whilst the telephone exchange could be towards Russell-street. When, before the Committee a few days ago, I referred to the important development on the telephone side of the Department in Queensland, and I desire to submit the following statement:—

Revenue	1907-8.			1910-20.		
	£	s.	d.	£	s.	d.
Private Boxes and Bags	2,722	8	7	7,865	16	8
Order Commission	14,057	11	0	24,020	8	3
Telegraphs	107,800	5	5	201,623	4	5
Telephones	48,128	10	8	305,280	11	1
Miscellaneous	11,855	18	3	27,242	0	2
Postages	270,054	8	1	409,866	16	8
War Postage	...	...	...	106,258	1	9
Total	450,260	5	9	1,082,954	17	0

In 1907-8 the telephone revenue was 10.24 per cent. of the whole, and this percentage increased to 31.4 per cent. in 1911-20 (exclusive of War Postage). The telephonic receipts first exceeded the telegraphic revenue in the year 1914-15, as shown below:—

Telegraphs £151,010 6s. 6d.	1913-14, £144,889 0s. 11d.
Telephones £166,295 10s. 8d.	1913-14, £180,127 1s. 11d.

I also present a plan of the Newmarket land, showing the price paid for it.

(Taken at Melbourne.)

TUESDAY, 26th APRIL, 1921.

Present:

Mr. GREGORY, Chairman,	Mr. Mackay,
Senator NEWLAND,	Mr. Mathews,
Senator PLAIN,	Mr. Parker Moloney,
Mr. ATKINSON,	Mr. Bamford,
Mr. BARNFORD,	

John Smith Murdoch, Chief Architect, Commonwealth Works and Railways Department, sworn and examined.

63. *To the Chairman.*—The Works Department have prepared drawings and estimates of the cost of buildings for automatic telephone exchanges at Albion and Newmarket, suburbs of Brisbane, to meet the views of the technical officers of the Department of the Postmaster-General. The estimated cost of the Albion exchange is—building £4,360, electric lighting £140, air

conditioning plant \$3,000. The last item covers the mechanical apparatus necessary to keep the air in the switch room in that uniform condition which an automatic telephone exchange requires. The Albion exchange is situated at the corner of New Sandgate-road, Oriell-road and Bell-street. It has a frontage of 150 feet 9 inches to a small public garden between the site and New Sandgate-road. The frontage to Oriell-road is 68 feet 14 inches, and that to Bell-street 69 feet 34 inches. I understand that the Postal Department have an idea of erecting a branch post-office on the same site, with a view to replacing the existing post-office at Albion, and there will be enough room left for the purpose, as the Telephone Exchange will only occupy, approximately, about half the available site. The building proposed to be erected will be of brick, and of a plain and simple appearance. The switch room will be 61 feet by 43 feet, and will be 15 feet high. It will have a timber frame roof ceiled and covered with galvanized iron. At the end of the switch room will be the battery room 43 feet 6½ inches by 14 feet. The other accessory rooms built around the main switch room will be the inspector's room 11 feet 6 inches by 9 feet 6 inches, the linemen's room 11 feet 6 inches by 9 feet 6 inches, a luncheon room 14 feet by 11 feet 6 inches, and the air conditioning plant room 25 feet by 11 feet 6 inches. The battery room and other accessory rooms are all to be 10 feet high. There will be the usual graded entrance to a tunnel provided in the switch room so that the cables can be taken into the building. In order to make the building as dust proof and fireproof as possible, all the window sashes will be of steel with fireproof reinforced glazing. Although the building will be kept down to absolute simplicity of design it will have effect quite commensurate with the site, which is a suburban one. There will be 4,436 square feet in the whole building, so that the cost will be a little over £1 per square foot. Material is a little cheaper in Brisbane as compared with Melbourne, but wages are a little higher. I expect that the cost will be about 2s. or 2s. 2½ per square foot. Tenders will be called for the construction. When the Exchange is erected there will be 80 feet by 68 feet available for the building of a post-office, and if the latter is made a two-story building, accommodation could be provided for a post-master's quarters, but in suburban post-offices it is not now usual to provide residences for the postmasters. It is unprofitable for the Government to build post-master's residences seeing the officers are only charged 10 per cent. of their salary for rent, and that does not meet anything like interest on the cost of building nowadays. The building at Albion has been designed in touch with the officers of the Postal Department. The original plan was prepared by the officer of the Public Works Department in Brisbane, in touch with the post office electrical engineer at Brisbane, but when it came to Melbourne with his estimate of cost it was referred by us to the Chief Electrical Engineer's office in Melbourne, and they had altogether different views about it. The plan now before the Committee was prepared to meet the views of the head-quarters office in Melbourne. I cannot see anything in the view expressed by the Electrical Engineer in Brisbane to the Committee, that the air conditioning plant should be placed in the yard. Why have it in the yard when there is room for it up against the building, particularly when it cannot impede the light of the switch room. As the switch room is 15 feet high and the battery room and other adjoining rooms are only 10 feet high, ample opportunity is afforded to have natural daylight supplied to the switch room on four sides above the level of the roofs of the smaller rooms. There is a thick brick wall between the air conditioning plant room and the switch room which should not make the switch room hotter than it would otherwise be if the air conditioning plant were not adjoining. I think it would be interesting to the Committee to examine

Mr. Dixon, our mechanical engineer, on the air conditioning subject. This is the first time I heard that there was any objection to the air conditioning plant being built alongside the switch room. It is not unusual for the ideas of the Electrical Engineer's officers in the States not to be in accord with the views of the officers in Melbourne. The original design sent down to Brisbane was for a verandah in front of the arrangement suggested in the plans before the Committee follows the line adopted in Melbourne, at Collingwood and Ascot Vale, where the Exchanges are on the one floor plan, the most convenient where the space is available. When I was in Brisbane I did not get into touch with any of the officers there on this subject. I expected to be called to give evidence in Brisbane before the Committee. The last thing I expected was to hear any objection to these plans, to which approval had been given by the Post-office Department, and which had been prepared to meet the views of that Department. In those circumstances one would not expect an officer of the Department to say that they were not suitable. I did have a conversation with the Deputy Postmaster-General in Brisbane in reference to acquiring the adjoining block of land on which there are two houses erected. According to the evidence given in Brisbane the purchase of these premises might obviate the necessity for erecting an inspector's room, a livemen's room, and a dining room. It is for this Committee to say whether it is advisable or not to buy that adjoining block of land. I have no proposal to build a new post-office at the present time. There is a good deal of local feeling against the removal of the existing office. The galvanized-iron roofing will be 24-gauge with rolled joints. The ceiling will be of small corrugated galvanized iron, 24-gauge. The space between the ceiling and the roof will be about 9 feet in the case of the battery room, and almost the universal ceiling in Brisbane. The large hallstones which fall there break tiles and slates, and put dents into iron of a smaller gauge than 24. Elsewhere in Australia 26-gauge iron is used, but it could not be adopted in Brisbane.

64. *To the Chairman.*—There may be a slight noise from the air conditioning plant, but not sufficient to interrupt the work of the three or four mechanics in the switch-room. It is not like a manual exchange where a noise would interfere. The wall of the switch-room where the boiler flue rises might be hotter than the other part of the wall, but I should imagine that it would all assist in conditioning the air in the switch-room. Natural light must penetrate into the switch-room between the frames, but on the plans as shown to the Committee the engineer will have as much natural light coming from four sides as he could wish for. If considered necessary, the building could be extended long ways. If the policy of the post-office is to supply quarters for its postmasters, I should advise the Department to acquire the adjoining block of land, otherwise there will be ample room on the present site for a moderate extension of the exchange, and for the erection of a post-office to meet the requirements of a suburban building. It is the function of the Postal Department to say whether more land is necessary. The Deputy Postmaster-General at Brisbane says that the officer of his Department requires the acquisition of the neighbouring property, and I do not feel that I can say it does not. The Albion Post Office, which I have known for thirty years, is situated in the business centre of the district, and there is sufficient land there for the erection of a new building.

65. *To Mr. Parker Maloney.*—I cannot talk with any authority as to the estimate of the cost of the air conditioning plant. It certainly does seem rather striking that the cost of this plant is almost equal to the cost of the building itself. The purpose of the plant is to keep the switch room at an even condition of dryness and temperature. In Perth, the air is kept at a certain degree of temperature by hot water

radiation. That was the first method we tried, and it proved only partially successful. The system is undervalued very much better now, and the whole method of dealing with air conditioning is becoming more and more perfect with every new automatic exchange we put up. It is the mechanical engineer of our Department who works out all the details in connexion with these plans, and he acts in conjunction with the Chief Electrical Engineer of the Postal Department. The latest systems have been installed in the Adelaide Exchange. A great deal of experimenting was indulged in with the result that more information on the subject has been gained. The Geelong system is a small dry air installation, but the Geelong plant suffered in comparison with other places because it had been installed in an old building temporarily adapted for the purpose. Mr. Dixon, our mechanical engineer, returned from the war, *via* America, and saw all the latest methods in connexion with air conditioning. Even at the smaller exchange at Nowmarket, it is proposed to install an air conditioning plant costing £3,000.

66. *To Mr. Mackay.*—The only verandah in the building will be a small entrance verandah 12 feet long by 9 ft. 6 in. wide. A larger verandah need not be provided for a building such as this in which only a few men will be employed, and it would be hardly legitimate to provide a verandah for the sake of appearance. The plainness of the structure is quite consistent with the type of buildings in the district. I would not like to see a lot of elaboration on it. Metal ceilings are more fire resisting than wooden. Warehouses in Brisbane are usually ceiled with small corrugated iron which looks fairly well, is fairly fire resisting and is less a harbour for vermin. Iron has a decided advantage over wood. It will allow less dust to come through and the cost is approximately the same as that of a wooden ceiling.

67. *To Mr. Atkinson.*—The cost of the air conditioning plant is due to the present high price of material. I have no doubt that in a little time these prices will be reduced. Practically all the material is made in Australia. There is a possibility of a reduction of 33 per cent. in the future which should bring the cost of the air conditioning plant down to £2,000, but that would only mean a saving of £50 or £60 per year. I do not think the whole project should wait for the prospect of such a reduction in price. I do not think such a reduction would come about in a few months, but it is hard to foretell market movements. Metals are all going down in price.

68. *To Mr. Matthews.*—My knowledge in regard to the air conditioning plant is rather imperfect, but I do not think the boiler requires constant attention. If there is a spell of even weather I understand the degree of air is brought up to what is required, and the plant is expected to carry on itself for a considerable period. The only thing I am certain about is that an automatic exchange cannot be built without an air conditioning plant. I selected the particular location of the exchange on this site as being the only possible spot for it while leaving room for a future post office. I understand that the system is to have a satellite exchange. There is to be a satellite exchange at Nowmarket. If the post office to be built on the site in the future will occupy 50 feet it will leave room for a 20 ft. extension of the switch room with a space of 10 feet between the two buildings. If the policy of the Postal Department is to house its officers it would be necessary to acquire the adjoining block of land. If that is the policy of the Department it would be possible to have on the area now available a post office of a size that would always be suitable for this district, and an automatic telephone exchange with all the room for extension if it is likely to need. But in that case there would be no yard space available, and it is usually an advantage to have an area alongside a telephone exchange for holding poles, casks, and trolleys, &c. If it is the policy of the

Department to remove the post office from Albion down to the site of the exchange, and if it is proposed to create quarters for the postmaster, additional space must be acquired, and even outside the requirements of the postmaster further land would be an advantage if it should be decided to shift the post office.

69. *To Senator Nealand.* The air conditioning plant would take up the same amount of space whatever it was put on the site. I cannot understand the idea of asking that it should be separate from the main building. In every automatic telephone exchange you must be sure to have it secure to have it close to the room in which the air is to be conditioned. It is clear to me that Mr. Sutton overlooked the matter of lighting. We are getting light on all sides of the switch room. To separate the air conditioning plant from the main building would add to the cost, and I think would decrease the efficiency of the plant.

70. *To the Chairman.* At Nowmarket, it is proposed to erect what is technically known as the satellite exchange, the cost being estimated for building £2,875, for electric lighting £75, and for the air conditioning plant £300. The building to be erected is of a triangular shape of ground at the junction of Gault-street and Abuklea-street. Two methods of construction are proposed for economical reasons. The main building will be of brick, and will contain a switch room, 33 feet by 25 feet, a battery room 17 ft. 4 in. by 14 feet, and an air conditioning plant room 25 feet by 14 feet. The switch room will be 14 feet high; the other rooms will be 10 ft. 6 in. high. The proposed construction is brick with concrete paving. There will be a timber frame roof with galvanized-iron roof covering and galvanized-iron ceiling with small corrugations. We propose to erect the out-buildings in timber. These wooden buildings will comprise the linemen's store 15 feet by 9 feet, the bin store 15 feet by 10 feet, the inspector's room 15 feet by 9 ft. 6 in., and the mechanic's room 15 feet by 11 feet. There will, of course, be the usual sanitary arrangements. All these sizes have been worked out to meet the views of the engineers of the Postal Department. The arrangement of the plan has been approved by the same Department. The saving by adopting wooden construction for these small out-buildings should be about 20 per cent., but as more will be required for maintenance later on I do not think there is a great deal of difference between brick and wooden construction. All the rooms could be contained in the one block, but as it may be necessary to extend the Exchange, room must be reserved on the site for its extension. If the smaller rooms were contiguous to the switch room, that is to say if they were added to the wing where the battery room is placed, there would be great difficulty in regard to levels, because there is a very steep slope from the back to the front of the building. If the rear buildings were attached to the front building it would be necessary to extend so far back into the site that a good deal more excavating would be involved. Apart from the question of the relative arrangement of the two buildings, it might be a good thing to build the outer structures in brick instead of timber. It might mean a little more money at first, but it would lead to a smaller outlay in maintenance. I cannot suggest any better arrangement for which the smaller buildings could be attached to the larger structure. In any case an extension to the south south-east, even for 20 feet, would begin to exhaust the usefulness of the site, because it would be approaching the narrow part of the triangle and would leave very little room for any other purpose. Even now, the building is on the extreme south boundary of the street alignment, and there is only a space of 8 feet between the structure and the west boundary. There is no danger of fire on the south-west side. The building is quite up to the standard in respect to making it fireproof. In any case it is quite isolated. I do not think it is necessary to make special provision against fire on account of the overhanging

roof. The steel frames for the windows are very much more dust proof than wooden sashes would be. The ordinary wooden sashes shrink, and the dust gets right around it, whereas there is no prospect of shrinkage in steel. In any case, an automatic exchange must have the dust excluded. We are not providing for a double ceiling to keep out dust. We are simply installing corrugated iron ceilings insulated over the top with seaweed material which reduces the temperature. Dust will certainly accumulate on such a ceiling, but no other ceiling would present less opportunity for dust getting through. There are fewer joints in the corrugated iron ceiling than there are in other types of ceiling. The objection to having a double ceiling is that a space is created to which there is no access.

71. *To Mr. Bamford.*—We estimate that the brick-work will cost £37 per rod. The mortar will be about two-fifths cement and three-fifths lime, which will make a very good mortar of hydraulic quality. By having the lime in the cement the laying will be expedited, because the lime works more freely under the trowel than does pure cement. Brisbane bricks are generally first class.

72. *To Mr. Atkinson.*—The wooden buildings will probably cost about £750 or £800. If built in brick the cost would probably be £1,000. But Queensland hardwood doesn't require much for maintenance. It need not even be painted.

73. *To the Chairman.*—Provision will be made for having a hydrant in each building.

74. *To Mr. Atkinson.*—The joints of the iron in the ceiling would be sweated and, of course, the iron would be painted. It will be as dust proof as a Wunderlich ceiling.

(Taken at Melbourne.)

WEDNESDAY, 27TH APRIL, 1921.

Present:

Mr. GREGORY, Chairman;

Senator Newland,

Mr. Mackay,

Senator Plain,

Mr. Mathews,

Mr. Atkinson,

Mr. Parker Moloney,

Mr. Bamford,

Henry Alexander Dixon, Chief Mechanical Engineer, Department of Works and Railways, sworn and examined.

75. *To the Chairman.*—I have occupied my present position for ten years. Previously, I was following my profession in Ceylon, Java, and Southern India in the employ of commercial firms. I served my apprenticeship at the Victoria Docks, London. On my way back to Australia from active service in Europe, I visited England and America by arrangement with the Department, and took the opportunity of investigating the subject of air conditioning as applied to ventilation. I may claim to have a special knowledge of that class of work. No detailed plans have been prepared of the air conditioning plants that are proposed for the Albion and Newmarket automatic Telephone Exchanges, because before the details can be finalized it will be necessary to know exactly what telephone equipment is to be installed, but I produce plans of similar plants at other places. Amongst them is a set of plans of the plant proposed for the Collinswood automatic telephone exchange, and we have just completed a similar equipment in Adelaide. Although the Adelaide Exchange is not automatic, the air conditioning plant installed there is similar to what will be required in the two Queensland exchanges. In connexion with automatic telephone equipment generally, two things are very necessary. As the equipment is very intricate, the least dust in the contacts causes

faults. Moisture is just as objectionable, because it causes a breakdown of the insulation. Faults arising from either of these causes are very serious, and the humidity in an automatic telephone exchange must not exceed 70 per cent.; that is the danger limit, and a lower percentage is desirable. There must be no dust at all. Both those factors have to be borne in mind in connexion with the efficiency of the mechanical service, but a further consideration is the comfort of the operating staff. High humidity is, of course, very unpleasant, and it is necessary for human comfort to keep the humidity even below the maximum figure prescribed for mechanical efficiency. There is no definite figure as to what humidity is excessive for human comfort and health, but something in the neighbourhood of 55 to 60 per cent. is regarded as reasonable. Of course, there are long periods in all parts of Australia when the humidity of the atmosphere is considerably above that figure. In Sydney, it ranges at times above 80 per cent., and it is much the same in all the capital cities. The method by which the humidity is reduced is termed the dew point control.

Air carrying a quantity of vapour will commence depositing moisture at a certain temperature. The condition of humidity is ascertained from the outside air which is then pumped into a conditioning room where it passes through a water-screen. A very fine spray of water plays upon the air as it passes through, and the air becomes washed and saturated with moisture. The amount of vapour which the air will absorb depends entirely upon the temperature. The lower the temperature of the air, the smaller the quantity of vapour it will absorb. When the aim is to reduce the humidity, we have first of all to reduce the temperature, and that is done by controlling the temperature of the water sprayed into it. In order to get the results we require, it is necessary to use water of a lower temperature than the ordinary town supply, and that is done by a mechanical refrigerating plant, the ordinary ammonia compressor. The air is saturated with water of a very low temperature; then it passes through a series of plates set at different angles and down which water flows. This contact removes the dust from the air. The Committee will see by looking at the plan that as the air rushes through between these plates very quickly, it strikes against the angles in the plates, which causes a sudden alteration in the direction of flow, as a result of which the suspended moisture is deposited at once. Those plates are made of galvanized steel. The air passes through these eliminating plates in a condition approaching 100 per cent. saturation, which means that it contains all the vapour that it will hold, but it is without any suspended moisture. It is then necessary to raise the temperature of the air to the degree required in the exchange. In doing that, an immediate drop in the relative humidity is caused. The air is heated by means of a boiler and steam or water coils, and is then pumped along a system of ducts into the exchange room; thence it finds its way out of the exchange through the ordinary channels. The atmosphere in the room is kept at a slightly higher pressure than that outside, so that the flow of the air is always outward; thus the air is kept in that state of cleanliness, humidity, and temperature that is desirable. I have seen similar plants in operation in America, where they are used largely. In fact, the latest regulations in Great Britain are necessary to install a plant of this sort in all public buildings. These regulations have led to specialization in this class of plant, and the one which I have just described is of the type that is used almost universally. It is found that the efficiency of operatives in a factory or business establishment is very largely increased when the atmospheric conditions are controlled in this way. These detailed plans show the arrangement in the machinery room. The air is drawn down a vertical duct from above the building into the conditioning chamber by means of a fan. In that chamber are the water sprays and eliminating plates by which the

surplus moisture is extracted, and heating coils by which the temperature is regulated. The motive power is an electric motor. Underneath the treatment chamber is a tank of water which is maintained at a very low temperature by means of an ammonia compressor, motor-driven. Then the air is pumped by means of a fan through a vertical duct and reticulated throughout the buildings. There is a cast-iron boiler for heating the coils by which the temperature of the air is raised. The plant which has just been completed at the Central Telephone Exchange, Adelaide, is the first of its kind to be installed in Australia. Statistics published in the *Commonwealth Year-Book* show that over a period of thirty years the highest average monthly humidity in Adelaide was 87 per cent.; Melbourne, 88 per cent.; Brisbane, 86 per cent.; Sydney, 92 per cent.; and Hobart, 95 per cent. The three makers of these plants—the Western Electric Company, Strouger, and Siemens—lay down 70 per cent. of humidity as the maximum for the proper working of an automatic exchange, and their guarantee is conditional upon the humidity not exceeding that figure. The size of the air conditioning plant does not depend entirely upon the area of a building to be served; there is a minimum below which you cannot go. The sizes of the plant do vary, but not in proportion to the area to be treated. As I have already said, no detailed plans have been prepared for the air conditioning plants at Albion and Newmarket Exchanges, and the estimate of £3,000 each was merely tentative. It is probable that in the smaller of the two exchanges the cost may be slightly less, although when I estimated £3,000 for each, I computed that the size and capacity of the plants would be approximately the same. A plant of this kind will last indefinitely. It will be designed to cope with the ultimate estimate of the exchange. It would be worth while to do otherwise, because the immediate saving would be very slight, whilst the cost of extending the plant in future would be comparatively great. In arriving at the size of the plant that is required, the quantity of air to be supplied is calculated from the cubic content of the building. The plant installed at the Adelaide manual exchange supplies not only the operating room, but the battery room, the operators' retiring room, and, in fact, the whole building, the cubic content of which is greater than that of either the Albion or Newmarket Exchanges. Accordingly the plant is larger than will be required for them. The estimated cost of the Adelaide plant was £4,500, but that has been exceeded by £200 or £300. Most of the plant was made in Australia; the only portions that were imported were the electric motors and the cast-iron boiler for heating the air. Boilers of this type are not made in Australia. The fan and the ammonia compressor were made in Sydney, and the duct work for the two new automatic exchanges in Queensland is reasonable. I should say that the labour of installing each plant will absorb probably £400. At the Perth Automatic Exchange there is an air treatment plant, but it is using the ordinary town supply of water, and as a result the humidity is not reduced as low as is required. There are times when the humidity is too high, and the only means of getting it down is by actually cooling the water. Complaints have been made in regard to the Perth Exchange, and I take it that the efficiency is decreased by the fact that the humidity is not kept down to 70 per cent. At any rate, the Postmaster-General's Department is constantly impressing upon us that we must reduce the humidity, otherwise the efficiency of the service falls off considerably. I do not think that the conditioning plant will involve the employment of additional staff. There is always a mechanical staff in the exchange, and the operation of this plant would not add materially to the work. In the Queensland exchanges the amount of heat required will be very small, and probably during lengthy periods it will not be necessary to use

the boiler at all. The only labour required will be for starting the motor-driven fan and compressor, and the motors operating the pumps. The man in charge would also have to watch the wet and dry bulbs, and make adjustments according to the readings. The ordinary mechanic employed generally in the exchange would be able to look after the air conditioning plant.

76. *To Mr. Parker Moloney.*—Generally the plant will probably require to be operated day and night, although there may be periods when it can be stopped. Certain defects in the existing automatic exchanges have been traced definitely to high humidity. The insulation had broken down, and the actual spot at which the moisture had caused the breakdown could be seen. I understand that that occurs frequently if the humidity is not properly regulated. The plant at Albion will probably cost £3,000, but it is possible that the Newmarket plant will cost less.

77. *To Mr. Mackay.*—The atmospheric conditions in Australia are very much better than those in America and other countries. We have not the same great extremes of temperature to contend with as has America; therefore the same need does not exist here for the installation of air conditioning plants in all large buildings, but I think that this type of plant will come into wide use for factories and warehouses. The processes of many manufactures can be made more efficient if the conditions of temperature and humidity are regulated, and in addition the operatives will enjoy greater comfort. This plant is being installed in the telephone exchanges primarily for the purpose of increasing the efficiency of the plant, but it will also be beneficial to the employees by giving them ideal atmospheric conditions.

78. *To Mr. Atkinson.*—I should say that the cost of the locally-manufactured plant is not greater than that of the imported article, whilst the quality is at least as good. I would prefer to have any plant of this sort made locally. I do not think there is any likelihood of the plants being obtained cheaper in the near future unless the cost of engineering manufactures drops. If the price of engineering services fall, the cost of the plant will decrease accordingly, but I cannot estimate when that will happen. There is no special reason why the cost of this plant should be high, apart from the abnormal prices obtaining for engineering services generally.

79. *To Mr. Mathews.*—The boiler to be used will be a cast iron sectional boiler of the type ordinarily employed for heating buildings. It is not a steam pressure boiler, and will not require a certificated attendant. A man will fire the boiler and leave it for some hours until it is necessary to re-stoke it. No danger attaches to the use of it. The only pressure upon the boiler is that due to the head of water in the building. For the working of this plant the Adelaide Exchange is in a better position than is an automatic exchange, because the former is manual, and there is always in the building a staff of mechanics who will be available to operate this plant as a part of their ordinary duty. As to whether there will always be a mechanic on duty at the Newmarket Exchange throughout the year, that is a question to be answered by the officers of the Telephone Department, but if any man is on duty for other purposes, it will not be necessary to incur additional expense by employing a man to operate the air conditioning plant. If no other man is employed during any portion of the 24 hours, one will be required for this plant. The air plant is not so sensitive as it is very rugged and will require very little attention, whilst the upkeep will be small.

80. *To the Chairman.*—There will be four electric motors that will merely require to be switched on. The boiler may require stoking every couple of hours. It will be necessary for a man to look at the ammonia compressor occasionally in order to see that the bearings are charged with oil, but it will have the ordinary drip feeds. I should say that the attention to this plant

will require a quarter of a man's time; that is to say, during a shift of eight hours, a man would spend in the room a total of two hours comprising the periods of a number of days throughout the shift. At other places where automatic exchanges are installed, the ordinary staff associated with the exchange locks after the air conditioning plant. If the wet bulb showed that the humidity of the outside atmosphere was below 70 per cent., the air plant could be stopped. The exchange room will be hermetically sealed; all the windows will be closed. When a door is opened some dust will enter the room, but it will be counteracted by the influence of the plant, which will be pumping in air continuously, thus maintaining a higher pressure inside the room than outside, and the outward flow of the air will counteract the tendency of the dust to enter when the door is opened. In Germany the operators before entering the exchange must go into a changing room and don rubber shoes and white overalls in order to avoid the possibility of carrying any dust into the exchange. I do not think there is much risk of dust being taken in by the operators, but I mention the German practice as an indication of the lengths to which precaution is carried elsewhere. Every effort will be made to render the exchange room dust-proof. We are not providing any special outlet duct. There is always a danger, if a special outlet is provided, of a return current bringing in dust. We are relying upon the ordinary outlets such as the aperture under the door. The sum of £3,000 may seem a big amount to spend on an air conditioning plant for a building that is to cost £4,000, but the cost of the plant must be compared not with the size of the building, but rather with the nature of the service which it is designed to protect. The efficiency of the whole automatic service is dependent upon the air conditioning plant. It is something that is beyond the experimental stage, it has been proved in both America and England. The Ford Motor Factory in America has, I think, about a dozen plants of this kind, and its treatment has developed considerably within the last few years.

(Taken at Melbourne.)

TUESDAY, 3rd MAY, 1921.

Present:

Mr. GREGORY, Chairman;

Senator Foll,	Mr. Mackay,
Senator Newland,	Mr. Mathews,
Senator Plain,	Mr. Parker Moloney.
Mr. Atkinson,	

Edgar Becher, Supervising Engineer, Chief Electrical Engineer's Staff, Central Office, Postmaster-General's Department, sworn and examined.

51. *To the Chairman.*—I have been associated with the proposal to erect automatic telephone exchanges at Albion and Newmarket, and, indeed, with all the automatic telephone exchanges in Australia, with the exception of those at Perth, Brighton, and Geelong. With regard to the air-conditioning plants installed at Albion and Newmarket, I may explain that unless the humidity of the atmosphere in an exchange is kept below 70 per cent. the insulation resistance of the cables—that is to say, their electrical quality—falls considerably below the standard required, with the result that an inferior service will be rendered. To obtain a first class service it is wise, therefore, to have an air-conditioning plant, which will keep the humidity at 70 per cent. Up to the present we have done without such plants by resorting to makeshift arrangements. For instance, when the cables fall below this standard we use a bank of electric lamps to radiate heat, and so to restore the cables to the required standard of insulation resistance. In some instances we have used for that purpose fuel fires or a gas stove. On hot

muggy days we arrange for a system of fans to keep the atmosphere moving. It is also essential that there should be as little dust as possible in an exchange; that is another reason why we propose to install the air-conditioning plants. We have a manual exchange, the Malvern Automatic Exchange and one at the City North Exchange, Sydney. We are also operating one in the manual exchange at Adelaide. I have no exact details as to plants employed in the United States of America, but in principle they are the same as that which we propose to install at Collingwood. I am confident that we are on right lines. We may have to amend a few details, but the principle, I am convinced, is quite right. As an engineer I pledge myself to the principle of the plant that we are putting in. When this plant is erected we shall not require any more than the ordinary mechanical staff that we employ in an automatic exchange, judging from our experience with the existing plants. The installation of this automatic plant will not mean a fraction of additional expenditure so far as the working of it is concerned. No estimate has been made of the expenditure that will be involved in the ultimate equipment of these two exchanges, for the reason that the market conditions are constantly varying. When the City North Exchange was projected we made such an estimate, because at that time the market for telephone equipment was quite stable. The price that we paid for the equipment to be used in the Collingwood Exchange averages £20 per subscriber's line, and these proposals have been prepared on that basis. The average pre-war price was between £8 and £9 per subscriber's line, for the Strowger type automatic equipment. That price covered everything. There is no doubt in my mind as to the efficiency of the service obtained from an automatic exchange. In the first place, the automatic eliminates the human element as far as is practicable. It eliminates the employment of telephonists, a machine is called upon to perform the service that a telephonist ordinarily carries out, and provided that machine is adjusted in accordance with the standards laid down by the manufacturers and our experience, an efficient service is obtained. The automatic exchanges that are operating in Perth, Melbourne, and Sydney are working on what is known as the "five-figure system"—when a subscriber wishes to call another subscriber, it is necessary to make five operations of the dial in order to establish the connection. The average time occupied by a subscriber connected with the Perth Exchange in calling a Perth subscriber or by a Malvern subscriber calling another subscriber to that exchange with the automatic system is between ten and twelve seconds, whereas a much longer time is involved in calling a subscriber under the manual system. The average number of Central Office faults in the automatic exchanges, Sydney—by that I mean in the exchange itself—for the year ended 31st December, 1920, was 0.52 per thousand lines per day. In common battery manual exchanges, Central Office, during the same period, the average Central Office faults were 1.78 per thousand lines per day. The average for New South Wales, Victoria, and Western Australia is 0.94 Central Office faults in the automatic and 1.26 faults per thousand lines per day in the Central Office in the common battery exchanges. I regret that I am not in a position to give you the list of actual complaints made by subscribers. At the present time I am analyzing the statement made to your Committee by Mr. Muir in regard to complaints relating to the Perth Automatic Exchange. The trouble in that exchange is that owing to the contractors finding it difficult to supply us with material during the war, we were unable to keep in hand sufficient equipment to keep the services in the Perth Exchange going as it should have been. As to the number of complaints to which Mr. Muir referred, I do not know whether it was explained to the Committee that many subscribers make complaints which, upon analysis, prove to be groundless.

82. *To Mr. Mathews.*—The trouble in the case of the Perth Exchange is that there are insufficient switches to take care of the traffic. We are taking steps to overcome the difficulty. If the contractors could supply us with the equipment to-morrow we could immediately eliminate the cause of complaint. During the war, however, the contractors sold out the whole of their equipment, and they have no reserve stocks. Now that the war is over, every telephone administration is in the market for equipment and material. It is but natural, in the circumstances, that suppliers abroad should sell at the hub of the market; they will not bother about our supplies while they are able to sell to the very centre of the world's market. That is what is happening to-day. America is clamouring for telephone services, and American manufacturers cannot supply fast enough the required equipment to meet the demand. The position is the same in Great Britain, but I am not sufficiently acquainted with the conditions of the market in other manufacturing countries to express an opinion in regard to them.

83. *To the Chairman.*—Some years have elapsed since the Perth Automatic Exchange was laid down, but I would not say that it has over-grown itself. An automatic exchange must have sufficient switches to carry the traffic. We have only to add more switches to the Perth Exchange and it will be as efficient as ever it was. The traffic demand has over-grown the capacity of the present plant, but, as I have said, we have merely to add more switches to render a thoroughly efficient service. We have not sufficient switches in many of the exchanges in Sydney to provide the service that should be forthcoming. Any trouble that has occurred has not been due to faults on the automatic system, nor can it be said that the fault rests with the Department. The last exchange to be cut-over in Sydney was the City North, and there was no difficulty in connection therewith. The other automatic exchanges that are of fairly long standing. The largest exchanges cut-over during the war, so far as I can remember, were at Ashfield, Mosman, and Chatswood. If the Department could get the plant, it would quickly have the switches in position. We, like other people, have also been hampered to some extent by lack of funds.

84. *To Senator Plain.*—We could not get the switches immediately even if the necessary funds were available. We have to order from the contractors, and none of them will guarantee to deliver within a given time. They generally write, "We offer you nine or twelve months' delivery, but that is not guaranteed."

85. *To the Chairman.*—You say that when the introduction of the automatic in Australia was first being proposed, Mr. Hesloth, who was then Chief Electrical Engineer of the Department, gave evidence before the Committee that the reduction in cost that would be effected by substituting the automatic for the manual system would probably be at least £1 per subscriber's line. I have not gone into the matter from that standpoint, but there certainly will be a saving in the Department. In the case of the Albion-Newmarket Exchange, the saving in the annual charges is estimated at £339 for the first year. In any event, we must have a new system at Albion. If we did not put in the automatic we should have to introduce the manual system. As to the saving effected in staff in the Albion Exchange at the present time, it is estimated that on the proposed date of the cut-over, viz., 1st June, 1921, there will be 22.66 telephonists, three monitors, and one supervisor employed there. Their total salaries at the present time amount to £3,300 a year. The employment of all these officers will be saved by the introduction of the automatic. Then, again, we shall not require the quarters necessary to house those officers, nor shall we want the fuel and lighting now requisite for them. That also is a consideration. The increase in the mechanical staff will not be anything like in proportion to the saving that we shall make in respect of telephonists.

86. *To Mr. Mathews.*—During the pre-war period it cost from £8 to £9 per subscriber's line to install the automatic system, while the pre-war cost of the common battery's multiple manual equipment was between £4 and £5 per subscriber's line. The present cost is £20 per line for the automatic and £15 10s. per line for the manual system.

87. *To Mr. Parker Moloney.*—The installation of the automatic has always been dearer than that of the manual system. It is difficult to get at the present actual cost of a large common battery multiple manual, because we have not installed one for a number of years. The figures I have given are the result of inquiries made in Great Britain during the preparations of these estimates.

88. *To the Chairman.*—The annual charges in respect of the automatic system in Albion as from 1st June, 1921, will be £20,818. For an up-to-date manual plant for Albion on the same date the annual charges would be £21,157. Those figures include working expenses, interest on capital, depreciation, and administrative charges. I have read the evidence given by Mr. Hesloth, to which you have referred this morning, and I am unable to determine upon what basis he arrived at the conclusion that the reduction effected by the installation of the automatic system would be at least £1 per annum per subscriber's line. Not knowing his premises, I cannot say how he arrived at that estimate, but I would not say that there was no justification for it. I have an open mind on the subject.

89. *The Chairman.* I had a memorandum sent to Mr. Sheldon, the Commonwealth Trade Commissioner in the United States of America, which was designed to get to this Committee the fullest information with regard to the operation of the automatic telephone system in America. In his reply, written on the 10th November, he states that—

With respect to the revenue derived from the different systems, the variations are that per subscriber the net balance of revenue in favour of the automatic system would be from one dollar to ten dollars, i.e., ten dollars in densely populated cities like New York. In arriving at this estimate they have taken the present rate being charged to subscribers, and the difference in favour of the company by adopting the automatic system would be the figures above quoted.

Taking Sydney and Melbourne as having similar conditions to, say, Boston, the experts with whom I have been in consultation here think there would be a saving in favour of the automatic system in its working of about eight dollars per subscriber in the Central Exchange.

If that is the position in America, there must be something wrong here, your costs must be enormous—I probably they pay much less for their plants. There are four well-known manufacturers of such plants, but we have only three types installed in Australia, viz., those of the Western Electric Company, Siemens, and the Automatic Telephone Company. We buy from the representatives in Australia. We have not endeavoured to make use of Mr. Sheldon in the purchase of equipment, but we have communicated with him in reference to one or two matters. We sent him, for information, regarding, amongst other things, a traffic recorder, which is a piece of apparatus to assist in determining the number of trunks needed in an automatic exchange. The reply was furnished through one of the local representatives here. We did not complain as to the receipt of the reply in that way. That is the recognised way of doing business. When Mr. Sheldon made this inquiry the firm in question knew that the information was required for the Commonwealth, and sent it to us through its local representative. So far as my memory serves, I think we received a letter from the Trade Commissioner, stating that the Western Electric Company was sending this information to us through its local

representative. The information required was highly technical, and would, therefore, be difficult for the Trade Commissioners to understand, so that it was probably thought that it would be far easier for a technical expert representing the firm here to discuss the matter with us. I do not think the Department has ever sent a specialist to the United States of America to inquire specially into prices as well as new inventions. The late Mr. Heslath went over there, and at the present time the Chief Electrical Engineer and an engineer are in America inquiring as to the latest developments in connection with all technical matters associated with the Department. I can assure the Commission, however, that every effort is made by the Department to get value for its money. As to the suggestion that local representatives of American firms might combine to charge us 50 per cent above the market price in the United States of America, I must confess that because of the widely differing characteristics of the plants we do not know the prices ruling from day to day for telephone plants in America. The installation of a plant in one exchange here may cost much less than another; it depends entirely upon circumstances. There are many varying factors. For instance, in the case of a plant with a very high calling rate, a large number of switches must be employed, and the cost per line will go up accordingly. The cost would be different where you had an exchange with a large percentage of outgoing junction traffic. Consequently, what it is said that the cost of a plant is so much per line one must have at the back of one's mind the local circumstances. If I were told that a plant in America cost £12 per subscriber's line, I would at once ask what was the calling rate and what were the other local conditions. A mere statement that a plant cost so much per line does not really convey much information. The estimate of £12,548 for equipment of the Albion Exchange does not include copper wire and cables for external construction. It relates solely to the cost of telephones to be used on subscribers' premises. The exchange equipment is estimated to cost £91,964. That does not include the external cables. The line plant is estimated at £1,797.

90. *To Mr. Mathews.*—The cost of equipping the Albion-Newmarket Exchanges with a manual plant would be 2,800 times £16 10s., since it is proposed to provide at the outset for 2,800 subscribers. That, however, does not disclose the full facts, because in making a comparison allowance must be made for annual charges. The moment you put in a manual plant you must allow for the employment of telephonists. One reason why the introduction of the automatic system does not show a greater saving is that its cost is much higher than the manual plant, and, consequently, the interest charges are higher. We have to allow £8,581 for interest charges on the automatic plant, as against £7,984 on the manual plant; but as against that working expenses for the automatic are put down at £5,634, and £7,141 for the manual, showing a difference of £1,500.

91. *To the Chairman.*—I do not know that we have entered into any agreement for the purchase of our copper wire.

92. *To Mr. Atkinson.*—The economy effected by a change from the manual to the automatic system is represented by hard cash in the shape of reduced annual charges, and in greater efficiency. The estimated saving of £339 for the first year of the working of this proposed new automatic exchange takes into cognisance all charges.

93. *To Senator Foll.*—I have calculated the estimated revenue from this new service on the basis of the conditions obtaining under the manual system, but my own personal experience is that with the introduction of the automatic system we get a larger revenue. People find that the automatic is more efficient, and, consequently, make more use of it than they did of the manual system. While that is my own experience, for the purposes of this proposal, however, I have merely

allowed that the revenue from the automatic will be the same as that received under manual system conditions. So far as I know it is not intended at the present time to make any reduction in the charges to subscribers.

94. *To Mr. Mathews.*—As to the need of an air-conditioning plant where the humidity of the atmosphere is more than 70 per cent, the effect upon the cables is bad, while the presence of dust has a detrimental effect upon the contacts of the relays of the equipment. The air-conditioning system that we are now trying has got beyond the experimental stage. I am confident that it will enable us to maintain the apparatus in an efficient state. We have an air-conditioning plant which in principle is exactly the same as that to be installed at the Albion Exchange. The cost of the air-conditioning plant at Malvern was £1,757. The main cause of the difficulty in the Perth Automatic Exchange at the present time is that the calling rate per subscriber is so high that the switches supplied will not meet the demand. We have only to put in more switches and the trouble will be overcome. We have not experienced the same difficulty at Geelong. There the calling rate is more constant, with the result that the switches are not overloaded. In the case of an exchange in a capital city such as Perth, we must allow a fairly wide margin to provide for special traffic demands. Telephone traffic is affected by weather and social conditions. A wet day makes a great difference in the calling rate; people do not leave their homes or their offices on a wet day to the same extent that they do on a fine day; they make more use of the telephone, and the number of calls is thus increased. On Melbourne Cup Day, again, we require every available position staffed by a telephonist to carry on the work of the Telephone Exchange here. At Armistice time, also, the telephonists simply could not answer all the people who were calling up the Exchange at the one moment. In the event of any abnormal local circumstances I would not say that the calling rate at Albion would rise as it has done at Perth, but the rise would not be to anything like the same extent.

95. *To Senator Foll.*—The complaints of delay in Sydney are due to another cause. Owing to shortage of funds the telephonists there are overloaded, and have been for some time, and we have not been able to get the requisite funds to reduce that overloading. I may say, however, that overloading is likely to occur in connexion with any telephone system in the world.

96. *To Mr. Mathews.*—I have never yet met a subscriber who would like to revert from the automatic to the manual system. I agree with the Chairman of the Perth Chamber of Manufacture who said that he would rather have the automatic in any circumstances than the manual system.

97. *To Senator Newman.*—I am not in a position to say how the Deputy Postmaster-General, Queensland, arrived at his first estimate of a saving of about £518 per annum by the adoption of the automatic system at the Albion Exchange. In the latter part of his evidence he said that the cost of a manual system would be £21,157, whereas it was estimated that under the automatic system it would be £20,818, showing a saving of £339. Those figures correspond with our estimate. He was supplied with a copy of the statement prepared for presentation to Parliament, and that statement showed that the estimated saving would be £339 for the first year. Those are the correct figures. With the automatic system you dispense with the telephonists, and you employ more mechanics, but not in the same ratio. I have here the actual figures as to the staff that we employed in manual exchanges in Sydney before the change-over to the automatic system was made. The mechanical staff employed in the eleven exchanges there which have been changed over to the automatic system increased by 1.32; in other words, where there was one mechanic employed under the manual system there are 1.32 employed under the

automatic. So far as I am aware, the telephonists who were employed in those exchanges under the manual system were not dismissed; when the change-over was made. In some cases they were transferred to other Departments of the Post Office, and in others they were sent to other exchanges. The salaries of the mechanics are higher than those of the telephonists. That would account to some slight extent for the comparatively small reduction effected by the change-over. The introduction of the automatic system will not do away with the use of switchboards in large business houses or Government Departments, where there is a lot of inter-extension traffic. It would be inconvenient for a business house or Government Department to call up the main exchange in order to communicate from one branch to another. By the use of small switchboards such communication is secured without calling up the exchange. In our telephone lists we print the letter which it is necessary to prefix to the number in order to call an automatic exchange. If you were a subscriber to an automatic exchange and wanted to connect with Central, for instance, you would call "C" on the dial. The telephonist in the Central Exchange would then answer your call, and on being told of the number you required would connect you with that number. On the other hand, if you were on the Central Exchange and wanted to be connected to a Malvern number, you would simply prefix the desired number with "U," which stands for Malvern, and request the Central telephonist to connect you. The delay involved in making such a call would be less than takes place under the ordinary manual service.

98. *To Mr. Parker Moloney.*—The working expenses under the automatic system to be installed at Albion-Newmarket are estimated at £5,634, as against £7,141 under the manual system. The estimate of working expenses includes the payment of £132 per annum for a card assistant and for attending to complainants at Albion and Newmarket. The maintenance of the equipment is set down at £3,062. That estimate includes the wages of the mechanical staff and the cost of material for maintaining the plant. In the Albion Exchange we shall have three shifts, but we do not propose to work shifts at Newmarket. For a time the plant at Newmarket will be small, and until it grows we hope to be able to run it without a staff at night time. Then, again, in the estimated working expenses under the automatic system at Albion and Newmarket we allow £92 for maintenance of the building, £210 per annum for the maintenance of the air-conditioning plant, and £2,168 for the maintenance of the line plant, or a total of £5,634 per annum. The £7,141 annual working expenses under the manual system is made up as follows:—Operating, £2,089; maintenance of equipment (including salaries of mechanics and cost of materials), £2,728; maintenance of the building, £51; maintenance of the line plant, £1,658; and maintenance of the air-conditioning plant, £1,051. In connexion with the automatic service the number of men employed in controlling the outside plant will not differ materially from the number now employed. We shall want a foreman, seven mechanics, and one junior for Albion; while for Newmarket we shall require a senior mechanic and one mechanic. The whole of the salaries paid for running the automatic at Albion will be £1,876 for the mechanical staff, plus £132 for the card assistant, and a proportion of the salary (say £207) of a man employed at the Central Exchange in looking after automatic equipment. Under the present manual system the salaries amount to £4,225 per annum. A substantial saving in salaries will thus be effected by the adoption of the automatic system. The increase made up of £5,881 for interest on capital as against £7,984 under the manual—a difference of £2,077 per annum; and £86 per annum for depreciation of the plant net for the automatic, as against £71 in the case of the manual.

Then, again, we shall have two air-conditioning plants, one each at Albion and Newmarket, as against the one that would be installed at Albion; and we have to allow £300 for depreciation of the two plants as against £195 under the proposed manual system. Further, the depreciation in exchange equipment in the case of the automatic is put down at £3,366, as against £2,679 under the manual. The differences are made up in that way.

99. *To Mr. Mackay.*—It will be necessary to install new instruments in the offices or homes of subscribers now using the manual exchange, but there will be no increased cost to subscribers. We shall replace their present instruments free of charge. The old instruments will be renovated and used in country centres.

100. *To the Chairman.*—When the plans of the proposed building were being prepared I was consulted in regard to them by the officers of the Department of Works and Railways, and am perfectly satisfied with them. I have read the evidence given by the State Engineer of the Department for Queensland, and I think he was under a misapprehension when he said that the presence of the air-conditioning plant room and other rooms immediately adjoining, and attached to the exchange building, would interfere with the lighting of the exchange. The roof construction of the rooms at the side is distinctly lower than that of the exchange, so that there will be ample provision for natural lighting from that side. It would be distinctly disadvantageous to separate the rooms from the exchange building. In the first place, it would involve the erection of an additional wall, and, secondly, if the air-conditioning plant were placed in a detached building some of the pipes would have to be insulated, and additional expense thus incurred. Then, again, the men would have to travel to and fro between the air-conditioning plant room, the inspectors' rooms, and the stores, and the time thus lost in the course of a year would be a considerable item. Furthermore, at night time, when there will be only one man on duty in the exchange, it is undesirable that he should be required to leave the exchange for any length of time. Under the plan as proposed the air-conditioning plant room will be attached to the exchange building so that the man on duty at night, if he had occasion to visit it, would be able to hear any alarm operating while he was there. I am perfectly satisfied with the plans. A galvanized-iron roof with eadings of small corrugated iron will be quite satisfactory. As long as the building is constructed in accordance with fire-resisting principles it will satisfy our requirements. Although the plans provide for an overhanging roof, I think we may say that as nearly as possible the building will be fire-resisting. It is true, as you say, that the plans do not provide for proper fire-fighting installations. They were not prepared by our Department, and, although, as you say, we have approved of them, our consent or approval relates mainly to the accommodation provided, and does not cover details with regard to fire-resisting installations and so forth. We look to the Department of Works and Railways to provide for such matters, and to comply with the regulations of the local fire offices. Having regard to the value of the plant to be installed, the most up-to-date fire-fighting appliances should be provided. The Newmarket plan shows a wood-lined building along the main exchange building. I should be quite happy to see it constructed of wood. Our men have to take very great precautions against fire, and I do not think that the steel on the building will give us any special risk. I agree with you that there is always a risk of fire breaking out in a neighbouring building and extending to our own, but I do not think any undue danger will be run by erecting this building of wood.

101. *To Mr. Atkinson.*—We have a fire-fighting plant installed in all the exchanges that we erect, whether they are for the manual or the automatic system. We have cylinders containing a specially prepared compound which, if applied to the equipment, on an outbreak of

fire, would not damage the equipment in any way. On the other hand, if water were thrown upon the equipment to any extent it would probably damage it beyond repair. I do not think the provision of water mains and special fire-fighting appliances has been purposely omitted on that account. The Department of Works and Railways has never been instructed by us to make any such omission. I personally visited the Malvern Exchange, accompanied by a representative of the Metropolitan Fire Brigade, in order to discuss with him the fire-fighting plant that should be introduced there. I know of no telephone exchange in the metropolitan areas of the Commonwealth that is without fire-fighting appliances. We have a water service as well as special appliances, such as asbestos blankets, and cylinders containing a chemical compound, designed to cope with any fire that might occur.