

1923-24.

THE PARLIAMENT OF THE COMMONWEALTH OF AUSTRALIA

PARLIAMENTARY STANDING COMMITTEE
ON PUBLIC WORKS.

REPORT

TOGETHER WITH

MINUTES OF EVIDENCE

RELATING TO THE PROPOSED ESTABLISHMENT OF

AUTOMATIC TELEPHONE EXCHANGES

AT

UNLEY AND NORWOOD, SOUTH AUSTRALIA.

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MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

(Fourth Committee.)

The Honorable HENRY GREGORY, M.P., Chairman.

Senate.

Senator John Barnes.†
 Senator Hattil Spencer Foll.‡
 Senator Patrick Joseph Lynch.†
 Senator John Newland.‡
 Senator William Plain.*
 Senator Matthew Reid.†

* Ceased to be a Member of the Senate, 30th June, 1923.

House of Representatives.

Arthur Blakeley, Esq., M.P.
 Robert Cook, Esq., M.P.
 David Sydney Jackson, Esq., M.P.
 George Hugh Mackay, Esq., M.P.
 James Mathews, Esq., M.P.

† Appointed 5th July, 1923.

‡ Resigned 28th June, 1923.

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EXTRACT FROM VOTES AND PROCEEDINGS OF THE HOUSE OF REPRESENTATIVES, No. 74 OF 20TH JUNE, 1924.

6. PUBLIC WORKS COMMITTEE—REFERENCE OF WORKS—AUTOMATIC TELEPHONE EXCHANGES, UNLEY AND NORWOOD.—Mr. Stewart (Minister for Works and Railways) moved, pursuant to notice, That, in accordance with the provisions of the *Commonwealth Public Works Committee Act 1913-21*, the following works be referred to the Parliamentary Standing Committee on Public Works for its investigation and report thereon, viz :—
 Establishment of Automatic Telephone Exchanges at Unley and Norwood, South Australia.
 Mr. Stewart having laid on the Table plans, &c., in connexion with the proposed works—
 Debate ensued.
 Question—put and passed.

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AUTOMATIC TELEPHONE EXCHANGES, UNLEY AND NORWOOD.

REPORT.

The Parliamentary Standing Committee on Public Works, to which the House of Representatives referred, for investigation and report, the question of the proposed establishment of automatic telephone exchanges at Unley and Norwood, South Australia, has the honour to report as follows :—

INTRODUCTORY.

1. The present Unley semi-automatic exchange was brought into operation on 12th April, 1919, and the present Norwood exchange on 21st June, 1919. The Unley system was increased by the addition on 31st January, 1924, of a new unit called Hyde which will accommodate 600 subscribers' lines, and the Norwood equipment was increased by the installation on the 29th May, 1924, of a new unit called East which will accommodate 80 lines.

2. The development in these areas has, however, been such that the existing apparatus cannot cope with the business offering, and it is represented that if service is not to be refused to intending applicants in the near future, it is imperative that a full automatic system be established as early as possible.

3. Although two separate installations, these proposals are being dealt with together as they are identical in all respects, and may be regarded practically as twin exchanges.

They were built conjointly and cut-over practically together. Their present capacity is the same, and they are situated in areas approximately of the same type—residential, with shopping facilities.

They have the same system of working, and it is represented that if one installation were approved and the other refused, the position would be so complicated as to render it economically unsound. They are what are known as semi-automatic exchanges, and are the only ones of the type working in the Commonwealth.

PRESENT PROPOSAL.

4. The present proposal submitted is to extend the existing telephone exchange buildings situated at the corner of Northgate-street and Bellevue-avenue, Unley, and at the corner of East-parade and Maesbury-street, Norwood, and to install therein a full automatic telephone switching system having an initial capacity of 5,500 subscribers' lines at Unley, and 5,700 lines at Norwood, the exchanges to have an ultimate capacity of approximately 9,400 and 8,900 subscribers' lines respectively. It is proposed that the initial equipment shall be capable of extension to the ultimate capacity named, thereby affording sufficient accommodation for the anticipated development in the Unley and Norwood areas.

ESTIMATED COST.

5. The estimated immediate cost of the proposals as submitted to the Committee is as follows :—

	Unley. £	Norwood. £
Site	490	..
Building (cost of additions to existing buildings) ..	5,000	6,000
Air conditioning, heating, ventilating, vacuum cleaning, and air compression plant	3,250	3,250
Exchange equipment, including that necessary at other exchanges—(approximately £11,000)	107,019	110,704
Sub-station equipment	12,857	14,201
Cost of diversion of line plant	100	200
Cut-over	200	200
	<hr/> 128,916	<hr/> 134,555

COMMITTEE'S INVESTIGATIONS AND RECOMMENDATIONS.

6. The Committee visited the existing exchanges at Unley and Norwood, inspected the surrounding districts, and took evidence from the telephone engineers and works officers. A careful inspection was made of the additions proposed, and the questions of the buildings and their location were discussed in conversation with the mayors of the two suburbs. In addition, evidence was obtained from the Town Clerk, Norwood, on the subject of the proposal to widen East-parade on the present alignment of which it was proposed to erect portion of the building under consideration.

SITES.

7. *Unley.*—The land purchased at Unley is reported to be suitable from a building point of view, and added to the existing block would appear to provide ample accommodation to meet normal expansion for some years.

8. *Norwood.*—In the case of Norwood, representations were made that the councils of Norwood and Burnside have had under consideration a scheme for widening East-parade from 52 ft. 6 in. to 82 ft. 6 in., to bring it more in conformity with the roads leading into it at each end. It was stated in evidence that the amount of traffic using East-parade, added to the fact that there is a double line of tram track down the centre, makes it dangerous, and to overcome this it is proposed to add to the street a strip of land on each side.

In order to avoid the destruction of the scheme which would take place if these telephone buildings were erected on the existing street alignment as now proposed, the council suggests that the Commonwealth should transfer to it a 16 ft. 6 in. strip of its frontage along East-parade together with sufficient land to round off the corner of its area at the junction of East-parade and Maesbury-street. If the council's request be acceded to, the area of Commonwealth land remaining will not be sufficient to carry out the additions now contemplated, and it will be necessary to add to the Commonwealth block a further area on the south side of the exchange. The Committee considers that no obstacle should be placed in the way of the council improving the district as desired, and recommends that the land asked for should be transferred, providing sufficient land adjoining the telephone exchange on the south side be made available by the council to the Commonwealth without charge.

BUILDINGS.

9. The buildings proposed are to be of red brick, with floors of cement concrete. The roofs of new portions are to be semi-flat, constructed of reinforced concrete, plastered internally to form ceilings, and covered on top with bituminous roof covering. The roofs for the extension to the existing switch-rooms in both Unley and Norwood are to follow the present construction, namely, wood and iron. The sizes of the various rooms are to be as follow:—

Unley.

Present switch-room, 60 feet x 36 feet, to be extended to 75 ft. 6 in. x 36 feet.
Air conditioning room, including boiler-house, 32 ft. 3 in. x 24 ft. 6 in.
Battery room, 40 feet x 24 ft. 6 in.
Power room, 40 feet x 11 feet.
Staff luncheon room, 22 feet x 11 feet.
Bin store, 22 feet x 10 feet.
Lavatories, 22 feet x 9 ft. 9 in.

It is proposed to remove to new positions and re-use the present linemen's shed and motor garage.

Norwood.

Present switch-room, 60 feet x 36 feet, to be extended to 73 feet x 36 feet.
Air conditioning room, including boiler-house, 44 feet x 30 feet.
Battery room, 40 feet x 25 ft. 6 in.
Power room, 25 feet x average of 24 feet.
Staff luncheon room, 16 feet x 13 feet.
Bin store, 16 feet x 15 feet.
Linemen's store, 16 feet x 12 feet.
Motor garage, 16 feet x 11 feet.
Lavatories, 16 feet x 9 ft. 6 in.

The ceiling heights throughout new portions of both buildings are to be 10 feet.

The Committee learned that the plans for both these buildings were prepared after close collaboration between officials of the Postmaster-General's and the Works and Railways Departments, and is satisfied that they are suitable for the purpose for which they are intended. To minimize risk of fire, however, the Committee considers that steps should be taken to cover the under side of the eaves of the existing buildings and their proposed extensions with galvanized iron or other suitable material.

FINANCIAL ASPECT.

10. It was stated in evidence that the total annual charges of the existing semi-automatic system as at 31st December, 1924, with 2,300 lines connected, are estimated at : Unley, £23,394 ; Norwood, £23,355. The total annual charges of the proposed system as at 1st January, 1925, are given at : Unley, £28,209 ; Norwood, £29,388 ; and five years after date of cut-over at : Unley, £39,465 ; Norwood, £41,047. The estimated revenue at 1st January, 1925, is set down at Unley, £34,323 ; Norwood, £32,633 ; and five years later at : Unley, £58,994 ; Norwood, £54,709 ; so that five years after date of cut-over it is estimated that the annual revenue will exceed the total annual charges by £19,529 in the case of Unley, and £13,662 in the case of Norwood. The assets thrown spare and suitable for use elsewhere if the automatic equipment is installed are estimated to have a recoverable value of £37,171 in the case of Unley and £37,994 in the case of Norwood.

COMMITTEE'S RECOMMENDATION.

11. Under these circumstances, the Committee recommends that the proposed installations as recommended by the Department be put in hand as early as possible.

P. J. LYNCH,
Vice-Chairman.

Office of the Parliamentary Standing Committee on Public Works,
Federal Parliament House, Melbourne,
8th August, 1924.

MINUTES OF EVIDENCE.

(Taken in Melbourne.)

THURSDAY, 3RD JULY, 1924.

Present:

Mr. GREGORY, Chairman;

Senator Barnes | Mr. Cook
Senator Lynch | Mr. Jackson
Senator Reid | Mr. Mackay
Mr. Blakeley | Mr. Mathews.

John Murray Crawford, Chief Electrical Engineer, Postmaster-General's Department, Melbourne, sworn and examined.

1. To the Chairman.—I am aware that a reference has been submitted to the Public Works Committee concerning the installation of automatic telephone exchanges at Unley and Norwood, South Australia. The proposal is to extend the existing exchange buildings at Unley and Norwood, and to install therein a full automatic telephone switching system, having an immediate equipment of 5,500 lines at Unley and 5,700 lines at Norwood, the exchanges to have an ultimate capacity of approximately 9,400 and 8,900 lines respectively. It is proposed that the initial equipment shall be capable of extension to the capacity named, thereby affording sufficient accommodation for the anticipated development in the Unley and Norwood areas. The reason for this proposal is that the existing apparatus cannot cope with the development in the Unley and Norwood areas, and, if service is not to be refused to intending applicants in the near future, it is imperative that a full automatic system be established as early as possible. I shall supply the detailed estimate of costs for both installations at the same time. They are practically twin exchanges, and are identical in all respects. They were built conjointly and both cut-over practically together. Their present capacity is the same, and they are situated in areas approximately of the same type—residential, with shopping facilities. They have the same system of

working, and we really regard Unley and Norwood as twin exchanges. If one proposal was approved and the other turned down, it would throw the economics completely out, and such a position could not be maintained as economically as the proposal now submitted. They are what are known as semi-automatic exchanges, and are the only ones of that type working in the Commonwealth.

2. To Senator Reid.—They work in the same network, which ultimately will be entirely automatic. If different types of exchanges were at Unley and Norwood, there would be considerable loss entailed. The network I refer to is the Adelaide network, and by the word "network" I mean the area covered by a series of exchanges having inter-connexion.

3. To Mr. Mackay.—In a sense they are adjacent areas, being both adjacent to the city. There is not likely to be another exchange installed between them.

3A. To the Chairman.—The following is an estimate of the immediate cost of the work:—

	Unley.	Norwood.
	£	£
Site—		
(a) Value of existing site	199	328
(b) Estimated cost of additional site ..	490	..
Building (cost of additions to existing building)	4,700	5,300
Air-conditioning plant, &c.	3,250	3,250
Exchange equipment, including that necessary at other exchanges (approximately £11,000)	107,019	110,704
Substation equipment	12,857	14,201
Cost of diversion line plant	100	200
Cost of cutover	200	200
	128,815	134,183

The revenue derived from the present semi-automatic system and the revenue it is estimated will be obtained on the estimated date of conversion—1st January, 1925—and also with five years' development, is shown hereunder:—

Exchange.	Average number of subscribers' lines connected during year ended 30th June, 1923.	Annual revenue received, 30th June, 1923.	Estimated number of subscribers' lines at 1st January, 1925.	Estimated annual revenue, 1st January, 1925.	Estimated number of subscribers' lines, at 1st January, 1930.	Estimated annual revenue, 1st January 1930.
		£		£		£
Unley	1,534	16,454	3,200	34,323	5,500	58,994
Norwood	1,544	14,820	3,400	32,633	5,700	54,709

4. To Mr. Jackson.—The calling rate is higher in the case of Norwood, which accounts for the fact that the estimated revenue for that place is £4,000 more than that for Unley, although the former has less subscribers' lines. There is more business done in Unley than in Norwood.

5. To the Chairman.—I was asked last time I appeared before the Committee whether I could supply a

certificate from the accountant respecting the revenue figures. I hand in to the Committee a certificate from the accountant certifying to the figures I have just given.—[Certificate handed in.]—It is necessary that an addition to the present building be made in each case to accommodate the equipment for the increased number of lines on the automatic system, which at 1930 it is estimated will be—Unley, 5,500; Norwood, 5,700. The cost of such additions is estimated by the Works

and Railways Department at—Unley, £4,700; buildings are—Unley, £1,439; Norwood, £1,439. The Norwood, £5,300. The book values of the present following table deals with the financial aspect:—

Item.		Unley.	Norwood.	Five years after cutover.	
				Unley.	Norwood.
		£	£	£	£
1	Capital cost—New	128,815	134,183	138,940	144,488
2	„ „ New and <i>in situ</i>	248,001	259,791	340,229	352,311
3	Annual working expenses of existing semi-automatic system as at 31st December, 1924	10,559	13,693	..	..
4	Estimated annual charges of existing semi-automatic system as at 31st December, 1924, with 2,300 lines connected	23,394	23,355	..	..
5	Annual revenue—30th June, 1923	16,454	14,820	..	..
	Estimated as at 1st January, 1925	34,323	32,633	..	..
	„ „ 1st January, 1930 .. .. .	..	..	58,994	54,709
6	Annual working expenses on proposed new automatic system as at 1st January, 1925, and 1st January, 1930	8,035	8,352	12,724	13,328
7	Total annual charges automatic system as at 1st January, 1925, and 1st January, 1930	28,209	29,388	39,465	41,047
8	Assets recoverable or thrown spare by conversion to full automatic working—				
	(i) Value in position	44,856	45,472	..	..
	(ii) Recoverable value.. .. .	37,171	37,994	..	..
	(iii) Cost of recovery	1,741	1,469	..	..

Regarding item 8 of the foregoing statement, the differences between sub-items (i) and (ii), viz., £7,685 and £7,478 respectively, are amounts which will have to be written off in the departmental accounts as representing the proportion of the capital outlay on the original assets, which is irrecoverable, and includes depreciation due to wear and tear and labour in installation. That, briefly, is the proposal which the department submits to the Committee for its consideration and approval.

6. *To the Chairman.*—Both sites have been examined and are quite suitable. They are in the theoretical centre of the districts, having regard to the ultimate capacity of the exchanges. The Adelaide central exchange is a common battery manual system. It would be possible to work both Norwood and Unley with that system, of course; but if one of these two proposed exchanges is approved, and the other not, it will make the working expenses of that area much greater than they would be if both exchanges were approved. At present each place has a semi-automatic exchange, and the additional working expenses in case of one of the proposed automatic exchanges being approved, and the other not, would be incurred through working the automatic exchange into the semi-automatic network. The difference between the automatic exchange and the semi-automatic exchange is that in the automatic exchange the subscriber has a dial on his instrument, which he operates, and thus secures direct connexion with subscribers in the automatic area. In cases where he desires connexion with a manual or semi-automatic system, he dials direct to the desired exchange, and is then connected in the ordinary way with the subscriber he is calling. In the case of a semi-automatic system, the subscriber lifts his receiver and obtains connexion with the desired exchange by manual assistance. The type of buildings proposed to be erected at Norwood and Unley is according to the department's desires, and air-conditioning plants are provided for in each case. The humidity conditions in Adelaide make an air-conditioning plant necessary. The manufacturers of automatic exchanges stipulate that such plants must be installed in places where the humidity exceeds 70 degrees. That frequently happens in this area.

7. *To Mr. Mathews.*—Although I have not visited the United States of America, I understand that air-conditioning plants are installed in many exchanges there, and that they are of similar type to those which we propose to install here. These plants wash the air and keep it warm in winter, and cool it in the summer. There is one operating at present at Collingwood. I understand that the wisdom or otherwise of installing

air-conditioning plants is still a vexed question with some people, but our experience has been that they are necessary to ensure effective working. The plants cost about £3,000 or £4,000 each. I cannot say, offhand, whether one would be necessary at Canberra.

8. *To Senator Reid.*—In places like Vacluse and Mosman we have had considerable trouble, and have been obliged to incur very heavy expense, because of the humidity of the atmosphere. We had to renew all cables in Vacluse, Mosman, and Burwood on that account. An air-conditioning plant is now being installed in Mosman, and plants are on order for the other exchanges I mentioned. Our experience at City North and Collingwood has proved the value of air-conditioning plants. Much better service is possible with a plant than without one.

9. *To the Chairman.*—An air-conditioning plant is installed in the Adelaide exchange.

10. *To Mr. Mathews.*—The engineers of our department do not install the air-conditioning plants; they are put in by the officers of the Works and Railways Department at our request. We do not come into contact with the manufacturers. When we make a request to the Works and Railways Department for a plant, that is the end of it so far as we are concerned until the plant is installed.

11. *To the Chairman.*—The climatic conditions at Norwood and Unley make it highly desirable that we should install air-conditioning plants. A return which I obtained from the Meteorological Department gives the mean monthly humidity records at Adelaide from January, 1919, to March, 1921. They were taken at 9 a.m., 3 p.m., and 9 p.m. daily. In June, 1919, the humidity at 9 a.m. was 72, and at the same hour in June, 1920, it was 83. In the next month, at 9 a.m., it was 77. At 3 p.m. in June, 1920, the figure was 72. In 1919, the following 9 p.m. readings were taken.—May 78, June 77, July 74, August 71, and September 71. In 1920, the 9 p.m. readings were:—June 83, July 78, August 75, September 75, October 71. Humidity is experienced in both summer and winter. The conditions in Adelaide are different from those in Sydney. In Sydney we experience the highest humidity in the summer, but in Adelaide it is experienced in the winter. I have not brought with me a copy of our specifications for these proposed installations. The department issues a special specification for each proposal. We have skeleton specifications, but I do not know that they would be of much use to the Committee. I noticed the recent report that charged certain electrical engineering firms with adding a certain percentage to their tenders for work for the Sydney City Council, with a view to reimbursing unsuccessful

tenderers. I do not think that that kind of thing could happen to us, although, if it were done secretly, we would have no opportunity to find out. I did not understand that it was actually established that that actually occurred in Sydney. I understood that the report was more or less of a canard, and that the electrical people had effectively replied to the charge. If they admitted that they did it, I would not think they had made a good answer. I do not think that it is a desirable practice.

12. *To Senator Reid.*—As to whether or not that kind of thing is likely to happen here, I think it should be borne in mind that we have a number of competitors for this work who are most anxious to secure our orders. We do all that we can to make our specifications "fool proof." We take the utmost precautions to ensure that tenderers' prices are not ascertained until tenders are opened. The companies who generally tender for our work are the Automatic Telephone Co. Ltd., Siemens Bros. Ltd., the Western Electric Co., the British General Electric Co., and the Automatic Relay Co. We have no reason to believe that they add anything to their tenders to reimburse unsuccessful tenderers. Supposing they did do so, however, what would be our position? We could not go to any one else with our work. We secure tenders from all the possible tenderers, and, if they made an arrangement of that kind, we would still have to deal with them, or deny our people the facilities which they could provide. The morality of such action must be argued with the contractors. I personally would detest such a system. It may have some basis of reason in it, but I cannot see it.

13. *To Mr. Cook.*—The firms I mentioned have branches in Australia, and they hold practically a world monopoly for this work. We secure tenders from every possible maker.

14. *To the Chairman.*—Inquiries were made some time ago as to the respective cost of telephone equipment in Great Britain, the United States of America, and Australia. It was learned that, in certain instances, the manufacturers had supplied Australian requirements at a lower price than they had charged to the British Post Office. In some cases, of course, the Australian prices were higher. I believe that the British Post Office did not install automatic telephone systems during the war because it had no qualified men available to draw up specifications. All the men who could do that kind of work were engaged in war activities.

15. *To Senator Reid.*—Practically all the firms I mentioned are British, although some have large interests in the United States of America.

16. *To the Chairman.*—The average cost per subscriber of the last automatic telephone service we installed was £17 10s. During the war the cost was over £20 per subscriber. The prices I have given this morning are based on the cost of the last telephone exchanges we installed. When tenders for this work are let, it may be found that the price is a little higher or a little lower. In considering the respective cost per subscriber of the manual as against the automatic system the operating costs have to be taken into account. For instance, it may cost £17 10s. per subscriber for the automatic system and only £10 per subscriber for the manual system, but the annual operating charges with the manual system would be much higher on account of the large number of operators that would be required for it as compared with the automatic system. The annual revenue is estimated on the 1st January, 1925, as £34,323 at Unley. The total annual charges amount to £28,209, so that there will be a net annual profit of £6,114. The annual charges include interest on capital, depreciation, and administration; in fact, every expense is included. We have taken into account the loss incurred through pulling down portion of the manual switchboard. That is taken into consideration in arriving at the recoverable value, and from that we deduct the cost of recovery. The land that has been purchased will be suitable for further extensions when

required. For our ultimate requirements, we shall need no additional land. The type of building suggested by the Works Department will be quite suitable, and will allow for later extension.

17. *To Mr. Mathews.*—The Unley and Norwood exchanges are the only two of their type in the Commonwealth. In the first instance we, as did the British Post Office and most administrations, accepted the lower prices. We had had no experience of the different systems. It is only by experience that we can ascertain the most suitable system for our requirements. Hence we have actually three systems working in the Commonwealth. The Strowger type of automatic is working in Sydney, Melbourne, Perth, and Geelong. We have in Adelaide two other types of systems—one, a semi-automatic of the Siemens type, working at Port Adelaide, and the other, of the Western Electric type, at Unley and Norwood, in the Adelaide network. We have accepted tenders for Brisbane South, Newmarket, and one or two other exchanges. We have also proposals for the Adelaide network in respect of five other exchanges of the automatic type—at Glenelg, Prospect, Henley, Woodville, and Semaphore. If we had to maintain two different types of automatic apparatus at Unley and Norwood, the annual charges would be considerably increased. The machines at those places, when taken out, will be used for single network offices. Only five years of their life of twenty years have expired. They can be used in a place such as Launceston. All these systems are quite efficient. We have no fault to find with the existing systems in Unley and Norwood. The Committee, if it took evidence in Adelaide, would receive no complaints against the Western Electric type of switchboard. It is obviously more economical to have installed a single type of system—a step-by-step system—than to have one part of the network with that system and the other part with a different system altogether. By using one system, we get all the advantages of standardization. The difference in the tenders of the five firms was not very great. We did not get tenders from each of the firms for each of the types. In the case of one type we had one tender. We have had, I think, only two tenders from the British General Electric Co. At the beginning we had tenders only from Siemens and the Western Electric Coy., but now there are more firms in the field. Obviously, some firms would experience difficulty in making their plant fit in with a totally different system, and, therefore, could not compete for those areas so effectively as other firms with more suitable systems.

18. *To Mr. Mackay.*—We have not more than half a dozen air-conditioning plants in Australia. We have only two working that I would call complete. The others are only partly air-conditioning, having no refrigerating plant. The two complete air-conditioning plants are at Collingwood and City North. The plant at Collingwood has been installed for two or three years, and no fault has been found with that equipment. It does not work full time—only when necessary.

19. *To Senator Reid.*—In May last there were about 200 subscribers awaiting connexion with each of the exchanges at Norwood and Unley. We are making arrangements on the existing exchanges to supply their requirements. I should not be surprised if that number had now been considerably reduced. The capacity of the Norwood and Unley exchanges has just about reached its limit. The neighbourhood has grown considerably. Taking the Adelaide metropolitan and country districts, the percentage increase from the 3rd June, 1923, to the 3rd June, 1924, was 17 per cent. for the former and 20 per cent. for the latter. It will thus be seen that the increase was very heavy. It is proposed to take into the Unley exchange a small area that is at present in Central. It is really a rectification of the boundary. All the systems installed have been efficient, realizing expectations. It is the ap-

proved policy of all telephone administrations in networks of this type to install the automatic system. It would practically be possible to work in any system with our present system, but in some cases this could be done only at considerable cost, as it might be necessary to install a lot of additional plant. There is no reason why the department should go to that expense if it can be avoided. The tendency all over the world is for one type of equipment to hold sway in one area. In installing the new system at Unley and Norwood, we shall need to dismantle about £44,000 worth of equipment at Unley, and £45,000 worth at Norwood. That equipment can be used later, and will be quite up-to-date when installed.

20. *To Mr. Mathews.*—We are fitting the South Melbourne exchange in the same way as the Collingwood exchange. The work at South Melbourne is being carried out at about the same rate of speed. It is a big work, and I cannot say when it will be finished. We are working to the very limit of our capacity. In this case there will be no delay owing to the non-delivery of material. The delays at Collingwood were caused chiefly through the aftermath of the war, but those conditions have now largely disappeared.

21. *To Senator Reid.*—The Government installed the equipment at Collingwood with their own mechanics, and these men are doing the work at South Melbourne. We have a large number of skilled mechanics. The air-conditioning plant will be installed by the Works Department.

22. *To the Chairman.*—I suppose that the cost of this work at Unley and Norwood will be something like £45 per subscriber, and the annual charge about £8 10s. The allowance for depreciation for the automatic system varies on account of the residual value. For the estimated life of the switchboard equipment for automatic exchanges—twenty years—the residual value is 20 per cent., so that actually the depreciation charged is 4 per cent. That has been allowed for in the annual charges.

23. *To Mr. Mackay.*—There is no possibility of trunk line interruption as the result of the installation of different systems. We are making arrangements whereby a man speaking across a local line to a neighbour can be interrupted by the operator, and asked to take a trunk line call.

(Taken at Adelaide.)

SATURDAY, 26th JULY, 1924.

Present:

Mr. GREGORY, Chairman;

Senator Barnes

Senator Lynch

Senator Reid

Mr. Cook

Mr. Jackson.

James Walters Kitto, Deputy Postmaster-General for South Australia, sworn and examined.

24. *To the Chairman.*—The proposal for the erection of automatic telephone exchanges at Norwood and Unley is in accordance with representations from this office as to the growth of the telephone system in the metropolitan area, and the necessity for improved equipment to meet the expansion. At both Norwood and Unley the semi-automatic system is now installed. When it was introduced the percentage of local traffic at those centres was small, and the semi-automatic equipment was calculated to be the best to meet the needs of the time. It was anticipated that it would fulfil requirements for some years ahead, but the growth has been so rapid, and the percentage of local calls has been so great, that the full automatic system is required to meet present and prospective requirements. The automatic system should be put into operation as early as possible. There has been a rapid growth of population in the districts in question, and it is still increasing at a great rate. The present pro-

posals will, it is expected, meet requirements for the next 20 years, but it is not necessary to install the equipment to the full capacity of the premises forthwith. In the preparation of the plans and the designing of the plant, officers of our own department have consulted with officers of the Works and Railways Department, and the whole of the requirements, present and future, have been thoroughly considered. Provision has been made for an increase in the growth of the telephone system. In the metropolitan area we have 15,250 subscribers. In April 182 new subscribers were connected, in May 402, and in June 310, while 592 applicants are now waiting for service. At Unley and Norwood the present exchanges are utilized to their full capacity, and we have been compelled to adopt emergency measures to meet immediate needs. We have installed at Unley a separate unit called the Hyde exchange. It is really an appendage to the Unley exchange to carry the extra load for the period intervening between the present time and the time when the new equipment will be installed. At Norwood we have adopted a similar method, and have installed the East exchange. We anticipate that early in 1925, we shall increase the capacity of the Unley and Hyde exchanges to 2,580, and the Norwood and East exchanges to 2,000. Applications are being received at present at the rate of approximately 60 per month for Unley, and 40 per month for Norwood, and therefore we shall not meet the known needs, but it is the most we can undertake with the present buildings and with the semi-automatic equipment. No one can estimate the number of people waiting; many refrain from applying for telephones because they know the difficulty of obtaining connexion. We realize that the business offering is greater than the recorded figures indicate. Under the proposal for automatic equipment, Unley will have 5,500 and Norwood 5,700 lines, and later on it will be possible to increase the capacity to about 9,400 lines for Unley and 8,900 for Norwood. In recent years we have found difficulty in coping with the demands for service, but at present we are not held up through any lack of telephones or other material. We can now obtain wire from Port Kembla and insulators from Victoria. We have never had the automatic system in full operation in South Australia. The semi-automatic system does not involve dialling on the part of the subscriber, so that the public here are not yet experiencing the conditions obtaining in some of the other States. Comparatively few complaints have been made regarding the manual system. In Adelaide I have heard more expressions of appreciation than of dissatisfaction. I think perhaps that the public here are generally more appreciative than they are in some other centres. In the first place the service itself is better, and the public are quicker to express appreciation.

25. *To Senator Lynch.*—The outstanding difference between the full automatic and the semi-automatic systems is that in the former case the subscriber turns the dial and is automatically connected direct to the person to whom he wishes to speak, if that person is a subscriber to the same exchange. If he wishes to speak to a subscriber on another exchange he is automatically connected to the exchange through which he wishes to speak. The semi-automatic system provides for control by the central exchange of the switchboard at, say, Unley or Norwood. A subscriber attached to Norwood, when calling the exchange, now speaks actually to Central. He indicates the number he requires, and, even if it is a number on his own exchange, the call is operated from the central exchange, but with the full automatic system there will be direct communication between all subscribers attached to the one exchange. A person attached, to, say, the Unley exchange would, under the automatic system, be able to call direct to an Unley subscriber, but if he wished to speak through the Central or any other exchange he would have to dial the number which would give him direct communication to that exchange. The new system involves the substitution of a mechanical staff

for the present operating staff. With fewer operating requirements a more prompt service is obtained. The course of procedure followed in connexion with new telephone works is that central administration obtains the fullest information from the State Engineer, and the Telephone Manager. The representatives of the central administration confer with us on the spot, and the final decision rests with the secretary, Mr. Brown, who is the permanent head of the department. The latter, however, gives the fullest opportunity to the officers in the State to express their views. No doubt exists in my mind as to the superiority of the automatic system over any other, from the point of view of public convenience, but I should not care to express a final opinion upon the matter, since it is a technical subject. I can only judge of its effect upon service, and so far as my experience goes the automatic system gives more complete satisfaction than the manual, because of its promptness.

26. *To Mr. Cook.*—I consider that there will be an even greater demand for telephones in future than there has been in the past if we can meet the demand. Progress has been arrested by reason of the limited capacity of our exchanges. Many of the 592 people in the metropolitan area now waiting for telephones have applied months ago. The time occupied in connecting an applicant depends on his particular locality and such circumstances as whether there is a spare line available. At present we are losing revenue through inability to take the business offering.

27. *To the Chairman.*—The semi-automatic equipment at Unley or Norwood could not be merged into the full automatic system unless precisely the same class of equipment was adopted. If the equipment decided upon is of a different type, the present equipment at Unley and Norwood must be withdrawn, but it could be used at other growing centres, such as Port Pirie, Mt. Gambier, and Broken Hill, for which it would be very suitable.

28. *To Senator Reid.*—Of the 592 applicants waiting in the metropolitan area, 209 are at Unley and 176 at Norwood. They include both business people and private citizens. Unley is increasing as a business centre, and so is Norwood. They are both thickly populated residential suburbs, and could be classed as excellent districts for telephonic extension. The exchange equipment at Central has been over-burdened and many subscribers now connected with Central could be added to the proposed new suburban exchanges at Unley and Norwood. The present proposals will tend to relieve the congestion at Central.

29. *To Mr. Jackson.*—There is no danger of the proposals necessitating a reduction in the total staff employed. The growth in the country towns has been very rapid of late, and we are finding difficulty at present in staffing.

30. *To Senator Lynch.*—The time that will be taken in meeting the requirements of the waiting applicants will depend on the time occupied in installing the new equipment. Unley and Norwood are the two principal suburban centres. The Norwood exchange serves the whole of the eastern suburbs, and the Unley exchange the whole of the southern suburbs. I regard the proposal as very urgent.

MONDAY, 28TH JULY.

Present:

Mr. GREGORY, Chairman:

Senator Barnes.

Mr. Cook,

Senator Lynch,

Mr. Jackson.

Senator Reid,

James Simcoe Fitzmaurice, State Engineer, Postmaster-General's Department, Adelaide, sworn and examined.

31. *To the Chairman.*—The proposals submitted to the committee have been under the consideration of the department. At present we have the semi-auto-

matic system at both Unley and Norwood. It is of the Western Electric type, and represents a step between the full automatic and the manual systems. Under the manual system all calls are operated manually, but with the semi-automatic the calls from Central to Unley or Norwood are sent out by a "B" operator on key senders. The call passes through the registers, and automatically the switch apparatus at Unley comes into operation and calls the subscriber, but connexion must be obtained through the head office in Adelaide. That is the difficulty with the semi-automatic system; any Unley calls to Unley subscribers must of necessity pass over two junctions, and that is a very serious objection. Moreover, from my point of view, manual handling of a call is open to great objection, notwithstanding the fact that we have an excellent staff. It does not matter whether we have 100 per cent. efficiency in our semi-automatic plant, we still have to work through a manually-operated exchange with all the defects of manual operation. If the present proposal is adopted it is difficult to say what use can be made of the present plant, but there are probably quite a number of towns where these plants could be used with advantage, such as Broken Hill or Mt. Gambier, or in small states like Tasmania, where there is no very large network. The original idea in installing the semi-automatic was to eventually introduce the full automatic. A good deal of the semi-automatic apparatus could thus be used again for the full automatic system. We have two different systems, the Western Electric and Siemens, working into our common battery exchange. Experienced mechanics are required for the three systems. If we had all the various systems in operation we should need a set of mechanics for each, and that would not be economical. I maintain that one system should be adopted in each state. It is much more economical to employ one complete system for any one network, for the maintenance and replacement cost can thus be kept down. Tenders are, I think, open to all manufacturers. If we adopt one system only there must of necessity be a monopoly in that particular system, just as there is a monopoly by the gas company or the electric light company. You asked me whether we could not arrange for the equipment to be interchangeable. I point out that each manufacturer has his respective patents. I understand that the difficulty is overcome in Great Britain by the payment of royalties, but I do not see how we could overcome a monopoly in a special type of apparatus. You point out to me that, in tendering for the equipment required at Unley and Norwood, the price might be cut by one manufacturer to enable him to obtain all the extension work. There is that danger, but, notwithstanding any monopoly, I am strongly in favour of the system being identical in any one network. There are only about five firms that can quote for automatic equipment, and each has its own system. Since each type of equipment is protected, I do not see how we could provide specifications to cover all systems. I have prepared the following statement:—

1. I am aware of the reference to the Committee of the proposal to construct automatic telephone exchanges at Unley and Norwood. The establishment of automatic exchanges is a matter of Ministerial policy. The Department in South Australia merely gives effect to that policy, but it is considered that the automatic will give a better service than the semi-automatic system and will be more economical. There can be no doubt as to the necessity for this particular service. In my judgment it is absolutely essential to establish full automatic exchanges in these areas at the earliest possible date. The proposal is to extend the existing exchange buildings to provide for the development as set out in the financial statement. The existing Unley site has been extended by the purchase of an adjoining block in April, 1924, at a cost of £490. There is sufficient accommodation at the Norwood site for the proposed buildings.

2. The question of establishing automatic telephone exchanges at Unley and Norwood can best be considered by reviewing the position of the whole of the metropolitan system.

3. The whole system has now reached the stage at which it can no longer be extended on economical or satisfactory lines without an entire re-arrangement. It is congested, and some of the exchanges are rapidly becoming obsolete. In

many cases, lack of building accommodation prevents any further extension.

4. In order to meet this condition of affairs, a telephonic survey of the metropolitan area was made in the years 1919-1921, and these figures have, in some cases, been revised where it was seen that unusually heavy development was likely to take place. This was done in the case of Unley and Norwood, the latest survey having been made in 1923.

5. As a result of the 1919-1921 survey, a definite plan of action was decided upon. A proposal was submitted to the Chief Electrical Engineer and approval given by him, to the exchange lay-out and numbering scheme, the latest arrangement of which is shown in Drawing S.A.B.113, copy herewith.

6. It was decided that the existing equipment should be kept in use until it was either worn out, or incapable of extension, and 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 more up to date and newer than the suburban, the remodelling should commence in the suburbs. The Prospect, Glenelg, and Brighton proposals, submitted to the Public Works Committee in 1922, were prepared as a result of this fundamental plan, and the present Unley and Norwood proposals are also in accordance with the general scheme for conversion of the area to full automatic working.

7. One of the chief reasons for the adoption of the policy of expansion by automatic and the ultimate conversion to full automatic working throughout the network, was that the automatic system lends itself to a more economical cable 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. Thus the ultimate layout will provide for more exchanges than could economically exist with the manual system. It is proposed to add satellite exchanges from time to time as the necessity arises.

Take Prospect, for instance, a tramway has been extended on the North-East Road, and that part of the Prospect area is developing very rapidly. It may be necessary at a later date to establish a satellite exchange on that road. Then, again, the Dry Creek area is a manufacturing district, and we have a large number of subscribers in that locality. It will probably pay us

later on to establish a satellite exchange there. With the satellite exchange all calls from the locality of that exchange must pass through the main exchange. There is no direct calling from another exchange, say, Norwood, to Dry Creek, except through the Prospect Exchange. Dry Creek would be a satellite of Prospect, and would have no means of communication of its own with other exchanges.

8. The most urgent works at the present time are the automatic exchanges at Unley and Norwood, for the reason that these areas are rapidly developing, and the existing semi-automatic exchanges cannot be extended to cope with the development. Service has been refused in both areas and at present there are approximately 209 waiting applicants in the Unley area and 176 in the Norwood area.

9. The following figures represent the position of the existing exchanges as at 31st May, 1924:—

Exchange.	Capacity.		Number Connected.		Waiting Applicants (other than in ordinary course of completion).
	Local.	Multiple.	Lines.	Stations.	
Central	9,600	8,560	7,545	12,613	105
Prospect	600	600	485	517	10
Unley	2,240	2,520	2,059	2,173	128
Norwood	1,760	2,160	1,639	1,766	137
Port Adelaide ..	1,000	1,020	929	1,538	..
Glenelg	700	700	700	777	9
Brighton	360	..	295	332	..
Henley	480	..	428	456	4
Semaphore	300	..	243	254	..
Woodville	300	..	292	352	4
Blackwood	200	..	134	150	..
Stirling	320	..	294	327	4

The attached list shows the rate at which applications have been received for the various exchange areas during the twelve month ended 31st May, 1924:—

	Central.	Pro-spect.	Nor-wood.	Port Ade-laide.	Glenelg.	Henley.	Wood-ville.	Sema-phore.	Black-wood.	Stirling.	Brighton.	Unley.	
1923—													
June	97	..	16	2	12	6	4	3	1	..	8	35	= 184
July	91	..	25	12	12	6	5	3	4	4	4	45	= 211
August	78	25	26	5	18	9	4	5	4	3	7	42	= 226
September	72	37	15	3	13	4	5	2	2	4	5	40	= 202
October	90	21	36	7	10	4	2	3	4	2	5	39	= 223
November	76	35	26	7	15	9	6	6	4	4	2	37	= 227
December	73	19	19	4	8	12	3	5	..	5	9	29	= 186
1924—													
January	75	33	27	5	10	7	5	8	2	2	7	60	= 241
February	69	26	44	8	12	4	4	5	6	3	4	63	= 248
March	80	25	40	5	14	6	6	7	2	3	7	62	= 257
April	80	21	42	10	14	4	8	4	..	4	7	39	= 233
May	86	37	33	9	17	10	12	7	2	1	6	57	= 277
Total	967	279	349	77	155	81	64	58	31	35	71	548	= 2,715
Average	81	23	29	6	13	7	5	5	3	3	6	45	= 226

At present there are approximately 592 applicants who are being refused service in the metropolitan area, and it is estimated that the figures would be largely exceeded if it were known that service could be given.

The proposal is to extend the existing exchange buildings at Unley and Norwood and to install therein automatic telephone switching equipment, having an immediate capacity of 5,500 lines at Unley and 5,700 lines at Norwood, the exchanges to have an ultimate capacity of approximately 9,400 and 8,900 lines respectively. It is proposed that the initial equipment shall be capable of extension to the ultimate capacity named, thereby affording sufficient accommodation for the anticipated development in the Unley and Norwood areas. The proposed layout of the metropolitan area is shown on Drawing S.A.B. 113, and it will be seen that it is the intention to convert the existing semi-automatic satellite exchanges at Unley and Norwood to full automatic main exchanges. Structural alterations to the present buildings are proposed and it is considered that they can readily be extended to provide sufficient accommodation for the twenty year requirements. It will not, however, be necessary to carry out the whole of the work immediately. Owing to the rapid development in these areas, it is not possible to extend the existing equipment to meet the anticipated growth in view of the fact that the system in use is in each case limited to 2,000 lines. The temporary arrangements which have been made to carry on the service pending the establishment of the full automatic exchanges, consisted of the

opening of new exchanges in the present buildings, under the names of "Hyde" and "East." It would not, however, be economical to make further extensions in this manner on account of the fact that all traffic to and from the Unley and Norwood exchanges must be handled manually in Central. When the exchanges were first established, the percentage of local traffic was so low that full automatic equipment was not justified. Conditions have now altered, consequent upon the policy of establishing automatic exchanges at other centres in the network, and a continuance in use of the present equipment at Unley and Norwood would necessitate the handling manually in Central of all the local and transferred traffic of the former exchanges.

If Prospect, Glenelg, Brighton, and the other suburban exchanges are made automatic—and this has been agreed to—and if Unley and Norwood are not made automatic, all calls to those exchanges will have to pass through Central, or vice versa. If Unley and Norwood are made full automatic, all transfer traffic from Unley and Norwood to the other automatic exchanges will also be automatic, and will not have to pass through Central.

This would involve a large amount of unnecessary expense, both in operating costs and in the provision and maintenance

of keysets and associated equipment at Central. This would assume more serious proportions as the other exchanges in the area were converted to automatic working, and would cause great congestion in Central, as well as necessitating an extravagant provision of junction circuits. On the opening of Prospect, Glenelg, and Brighton automatic exchanges the establishment of which has already been approved, the transferred traffic will require to be handled in Central between these exchanges, and Unley and Norwood, unless automatic exchanges at the last mentioned places be provided, in which case the subscribers at the five exchanges could communicate with each other without the necessity for manual intervention at any stage, thus leading to economies in plant and a more rapid service.

The estimated immediate cost of the work is:—

	Unley.	Norwood.
Site—	£	£
(a) Value of existing site	199	328
(b) Estimated cost of additional site ..	490	..
Building (cost of additions to existing building)	4,700	5,300
Air conditioning plant, &c.	3,250	3,250
Exchange equipment, including that necessary at other exchanges (approximately £11,000) ..	107,019	110,704
Sub-station equipment	12,857	14,201
Cost of diversion line plant	100	200
Cost of cut-over equipment. . . .	200	200
	128,815	134,183

REVENUE AND ESTIMATED REVENUE.

The revenue derived from the present Semi-Automatic System and the revenue it is estimated will be obtained on the estimated date of conversion—1st January, 1925—and also with five years development, is shown hereunder:—

Exchange.	Average Number Subscribers' Lines connected during year ended 30.6.23.	Annual Revenue Received, 30.6.23.	Estimated Number of Lines (Subscribers) as at 1.1.25	Estimated Annual Revenue, 1.1.25.	Estimated Number of Subscribers' Lines at 1.1.30.	Estimated Annual Revenue 1.1.30.
		£		£		£
Unley ..	1,534	16,454	3,200	34,323	5,500	58,994
Norwood	1,544	14,820	3,400	32,633	5,700	54,709

BUILDING.

It is necessary that an addition to the present building be made in each case in order to accommodate the equipment for the increased number of lines on the automatic system, which at 1930 it is estimated will be:—

Unley—5,500 Norwood—5,700

The cost of such addition is estimated by the Works and Railways Department at—

Unley—£4,700 Norwood—£5,300

The book values of the present buildings are—

Unley—£1,439 Norwood—£1,439.

FINANCIAL ASPECT.

	Unley.	Norwood.	Five years after cut over.	
			Unley.	Norwood.
	£	£	£	£
1. Capital cost—new	128,815	134,183	138,940	144,488
2. Capital cost—new and <i>in situ</i>	248,001	259,791	340,229	352,311
3. Annual working expenses of existing semi-automatic system, as at 31.12.24 ..	10,559	10,693	..	..
4. Estimated annual charges of existing semi-automatic system, as at 31.12.24 ..	23,394	23,355	..	..
5. Annual revenue, 30.6.23 ..	16,454	14,820	..	..
Estimated, as at 1.1.25 ..	34,323	32,633	..	..
Estimated, as at 1.1.30 ..	..	..	58,994	54,709
6. Annual working expenses, automatic system, as at 1.1.25 and 1.1.30 ..	8,035	8,352	12,724	13,328
7. Total annual charges, automatic system, as at 1.1.25 and 1.1.30 ..	28,209	29,388	39,465	41,047
8. Assets recoverable or thrown spare by conversion to full automatic working—				
(i) Value in position ..	44,856	45,472	..	..
(ii) Recoverable value ..	37,171	37,994	..	..
(iii) Cost of recovery ..	1,741	1,469	..	..

Regarding item 8 of the foregoing statement the differences between sub-items (i) and (ii), viz., £7,685 and £7,478 respectively, are amounts which will have to be written off in the departmental accounts as representing the proportion of the capital outlay on the original assets which is irrecoverable, and includes depreciation due to wear and tear and labour in installation.

The map which I have placed on the wall for the guidance of the committee shows the proposed metropolitan network of exchanges. A proposal is to be submitted for a West Adelaide Exchange to relieve the congestion at Central. Woodville will be a main exchange until either Port Adelaide or West Adelaide is converted to full automatic. A new exchange is proposed for Glenelg, and the Brighton Exchange will be a satellite of Glenelg. It would not be economical to make Brighton an independent exchange at the present time, but it could be altered in future if the necessity arose. Stirling will eventually be a satellite of Norwood, and Blackwood a satellite of Unley. We reckoned in the first place that it would be possible to have the automatic system installed by the commencement of 1925, but I now doubt whether that is possible. Tenders have been called in anticipation of approval of the work, but I do not think we can hope to have the new exchanges in operation in less than eighteen months. We have allowed for depreciation to the extent of 4 per cent. on the estimated cost of equipment, 2.5 per cent. on conduits, and 1.155 per cent. on buildings. The Works and Railways Department has been in close collaboration with this department in regard to the type of buildings. The type selected is quite suitable for the locality. It is a fireproof building. I do not know what provision has been made in the way of fire-fighting appliances. We carry our own insurance. Apart from the capital loss that a fire would entail, it would also mean a fearful dislocation of business. I believe that the proposed buildings will be as fireproof as it is possible to make them. It is certainly worth while spending a little extra money in this direction for the purpose of obtaining immunity from fire. I admit that the eaves of the buildings are shown on the plan to project over the walls, but it is very rarely that a fire originates from outside a building. There will be no other building within 20 feet of the proposed exchanges. You ask me whether it would be wise to have parapet walls and a reinforced concrete roof. I admit that any precautions that can be taken against fire are desirable. The expenditure of an extra £500 or £600 in this direction, if it would make the building absolutely fireproof, would be justified. I agree that in a good suburb a tile or slate roof is preferable to galvanized iron. We leave the question of fireproofing entirely to the Works Department, but so far as accommodation is concerned there has been the closest collaboration between the two departments. An air-conditioning plant need not be as large for an automatic as for a manual exchange, because the staff employed in an automatic exchange is comparatively small. At present we have over 100 girls working in the manual exchange at Central, and the air becomes very trying, especially in the summer. The atmosphere would become unbearable at times if it were not for the air-conditioning plant. We do not use the plant continually, and it costs, on the average, about £18 per week. It is certainly an up-to-date plant. We have a refrigerator which we use in summer. We can regulate the humidity to any percentage desired, but even with this plant there are other little improvements that will need to be effected if we adhere to the manual system, for we shall need an exhaust to take the air away from the centre of the building. Year in and year out the Adelaide climate is very good, but we have humid conditions sometimes in winter. The air-conditioning plant is not required to be in constant operation. There are no prolonged periods with a humidity of over 70 per cent., although occasionally the humidity increases to 80 per cent. The greatest enemy to automatic working is dust.

32. To Mr. Jackson.—The average weekly cost of the air-conditioning plant in Adelaide, from 19th January, 1922, to 2nd January, 1924, was as follows:—Electric

power, £4 12s. 6d.; fuel, 13s. 8d.; lubricants, &c., 3s. 1d.; labour (attendance), £1 10s.; repairs, 8s. 3d.; water, 9s.; administration (35 per cent on all labour), 11s. 3d.; interest (4 per cent. on £4,800), £3 13s 10d.; depreciation at 6½ per cent., £6; a total of £18 1s. 7d. My experience of this plant has convinced me of its efficiency. I should recommend its use for the Unley and Norwood Exchanges, for we cannot hold contractors responsible for any defect in the working of equipment when they insist on a certain percentage of humidity not being exceeded. A refrigerating plant is necessary with the manual system, but I doubt whether it is required with the automatic. If it is required for the automatic system, it means the installation of only a very small plant. The equipment at Unley and Norwood would occupy a very small area.

33. *To Mr. Cook.*—Concrete buildings have proved satisfactory in Adelaide. I believe that some trouble has been experienced with them in Melbourne; but no similar complaint has been heard in Adelaide. Post-office extensions are being made in reinforced concrete combined with brick. The new building at the General Post Office in Adelaide has concrete floors and reinforced concrete supports, but the rest is to be of brick. The humidity is greater in Adelaide in winter than in summer. There may be combines operating in connexion with building in Adelaide. We have contracts with people in all parts of the world. So far as copper wire is concerned there is certainly a monopoly, for the Port Kembla Company supplies most of our needs in that direction. We are now overtaking the arrears in the matter of new telephone lines, and if we can only get the necessary material, and the automatic exchanges, we shall have no difficulty in coping with all the demands of the subscribers. We have already gone to large expense in undergrounding work in preparation for extensions. In regard to our main cables, we are looking ahead for five years, and in putting in laterals that are not likely to be taken up at any early date we generally provide for 15 or 20 years. The cost of labour in putting in a small length of big cable is so small that it does not pay us to look beyond a five-years' period. As far as practicable we are working in co-ordination with the engineers of the other states. A standard is laid down by central office, to whom, periodically, our costs for all classes of work are submitted. There has been remarkable growth in the metropolitan area in the last twelve months, due in the first place to the high salaries now paid. It used to be the custom to employ boys to run messages, but business houses now use the telephone instead, and they find it more satisfactory. Certainly about half the population of South Australia is settled in the metropolitan area, but there have been wonderfully good seasons of late, and the number of country subscribers is increasing at an enormous rate. Although Adelaide is not a large manufacturing centre, it has numerous other business interests which make the telephone necessary. The reason for the increased demand for telephone service is the general progress and prosperity of the state.

34. *To Senator Reid.*—The humidity is greatest in May and June. We have not noticed any effect on the equipment at Unley or Norwood that could be attributed to humidity. An air-conditioning plant is required at an automatic exchange, not in the interests of the staff so much as for the efficient working of the equipment. An attempt was made in Western Australia some time ago to regulate the temperature by means of steam-heating, but the mechanics found that they could not work under those conditions. In the early stages in Western Australia we had all sorts of troubles with the automatic system, and we cannot say how much of it was due to humidity. It we could obtain appliances that would be interchangeable with those of a rival manufacturer it would not make any difference in the working of the system, but if we had five exchanges with different systems, and if we wanted to increase one of the plants by 25 per cent., we should have to buy an extra 25 per cent. of the particular material required for that exchange only. If we wanted to increase other exchanges or put in switches to re-

place others that were undergoing repair, we should have no switches available unless we kept a stock suitable for each system. It would mean keeping a percentage of extra stock of each type, and the mechanics would need to be trained in the working of four or five different systems.

35. *To Senator Lynch.*—A common battery manual exchange becomes very expensive to work after it exceeds a certain number of lines, but with automatic working the cost is not increased in proportion to the size of the exchange. The adoption of the automatic system is becoming the settled policy of the department. When I came to Adelaide the present Unley and Norwood exchanges had what is called a 4-digit system, and would only take up to 2,000 lines. I communicated with the then Chief Electrical Engineer, and suggested that a scheme should be laid down and numbers given for the Adelaide network. Approval was obtained, and in about 1921 we got out our surveys and submitted them to the central office. There is close co-ordination between the State engineers and the Central office. So far as the engineers are concerned there is no doubt in their minds as to the pre-eminence of the automatic system. I do not think it would be in the interests of any of the firms supplying telephone equipment, any more than in the interests of the Port Kembla Company, to exceed the prices at which they are supplying material to-day. We shall have to trust to the combines, but it is hard to say what may happen in future. We estimate the life of an automatic exchange at 20 years. The Perth Exchange was installed in 1914, and after ten years some of the parts show no appreciable wear. These plants and the material used are being improved every year. At Central we have over 100 operators, and with the exception of the trunk-line girls, the services of the whole of them will be dispensed with when the automatic system is completely installed, but we shall require very few more mechanics than are at present employed. Those who will be temporarily displaced will probably be absorbed in other branches of the service. You point out that over a period of five years there has been no appreciable increase in the revenue, per subscriber, and there has been a scarcely perceptible decrease in the working expenses. I, therefore, do not think that there is likely to be any reduction in the telephone charges, although our cost of operating will be very much lower under the automatic system. In addition to that there will be a much more efficient service than there is at present. The automatic system knows no language at all, and delays such as are occasioned through subscribers not speaking plainly, will be eliminated. If we had the necessary switch equipment, we should have no difficulty in coping with the present demand for lines. The manufacturers have had to supply other countries that were probably in a worse position than Australia. As soon as the proposed automatic exchanges are established, and money is made available for lines and plant, we shall have no difficulty in meeting all the metropolitan requirements. I regard the installation of the proposed exchanges at Unley and Norwood as matters of great urgency. When the complete scheme for Adelaide is in operation, the maximum length of the line between subscribers in the network will perhaps be in the neighbourhood of 20 miles.

(Taken at Adelaide.)

TUESDAY, 29TH JULY, 1924.

Present:

Mr. GREGORY, Chairman;

Senator Barnes,	Mr. Cook,
Senator Lynch,	Mr. Jackson.
Senator Reid,	

Ernest Oswald Gooden, Town Clerk, Kensington and Norwood Corporation, sworn and examined.

36. *To the Chairman.*—I am aware of the inquiry being conducted by this committee into a proposal to

install automatic telephone exchanges at Unley and Norwood, and have seen the plans of the suggested buildings. I desire to bring under your notice a proposition which the corporation has under consideration in regard to East-parade. East-parade is the boundary between the corporations of Kensington and Norwood, and the District Council of Burnside, and has a width of 52 ft. 6 in. from building line to building line. Its eastern continuation is 99 feet wide, and the western extension is 82 ft. 6 in. Being only 52 ft. 6 in. wide and carrying a double tram track, East-parade is considered dangerous to traffic, and recently the Norwood and Burnside councils appointed a general committee to consider the best means of widening it. Mr. W. J. Earle, lately government town planner, and now in private practice, was asked to draw up a plan which is now being considered by the councils. The plan suggests the widening of East-parade to 82 ft. 6 in., which would necessitate taking a strip of land on each side. After negotiations by the Burnside council with the owner of the property opposite the telephone exchange, new shops which he was erecting have been set back 13 ft. 6 in., which, therefore, fixes the new alignment for that side of the street. My council asks that a piece of land 16 ft. 6 in. in width, the property of the Commonwealth, be made available for widening the Parade on their side. The full details of the scheme have not yet been finalized, but my corporation feels that it should lay the matter before your committee at this juncture, as if this opportunity is missed and building is commenced the chances of getting the necessary land would be lost. I produce a tracing showing the lay-out of the Commonwealth property and the portion the corporation desires should be made available to it. The area we desire transferred is a strip 16 ft. 6 in. wide along the East-parade frontage, together with a sufficient portion to enable the corner of the junction of the Parade and Maesbury-street to be properly rounded off. There are no buildings at present on the portion we desire. The land on the south side of the present exchange is vacant with the exception of a small galvanized-iron cottage on portion of it. On account of the public benefit which would be conferred by the widening of the Parade, I think my council would most certainly be prepared to consider the question of granting to the Commonwealth a sufficient area of land on the south side of the exchange to enable the building of the present projected automatic telephone exchange to be proceeded with. There is no doubt, in my mind, that the council will proceed with the widening of the road, although it may be some years before the full scheme is brought into effect. With a double line of trams and the amount of traffic now carried the road is considered dangerous, and to give reasonable traffic conditions it is, in my opinion, essential that the road should be widened.

36A. *To Mr. Cook.*—We have not yet made arrangements with the other owners of land which will be affected, as a final determination of the method to be adopted has not yet been arrived at. Under the Building Act of 1923 the corporation has power to define the building alignment, and it is suggested that a by-law should be passed so that all new buildings must be set back to the line now proposed. On such a question we would not need the consent of the ratepayers, although such consent would be necessary if we proposed to borrow money to purchase the land needed to widen the street. I think the people generally would be agreeable to the proposal when they saw the great benefit it would be. On investigation, I find that the cottage is the property of Thomas Alfred Houston, of Rundle-street, Adelaide. It is on land 25 feet by 70 feet, being part of lot 15 of block 112, Kensington, and is held under certificate of title 606/60. The vacant land to the south of the exchange comprises lots 11, 12, 13, 14 of block 112, Kensington, each 50 feet by 120 feet, and held under certificate of title 399/71. This land is owned by John William Hall Hullett, of Gilbert-street, Adelaide, and has been up for sale for many years.

37. *To Mr. Jackson.*—If necessary, we could compulsorily acquire the land we want for public purposes.

38. *To Mr. Cook.*—As I stated to the Chairman, I think the council would be prepared to compensate the Commonwealth for any land they obtained from them. I shall endeavour to obtain an idea of the value of the land the Commonwealth would want if they gave up the strip fronting East-parade.

39. *To Senator Reid.*—All the land fronting the parade is freehold. We have power under the act to resume any land required for public purposes. It is rather a fine point as to whether we would have power to acquire land on the south of the exchange to transfer to the Commonwealth as compensation for land granted to us on the Parade frontage.

40. *To Senator Lynch.*—Our powers of resumption do not apply to Commonwealth land. There are no other blocks along the street owned by public bodies which might be considered analogous to the land held by the Commonwealth. I recognize that if the Commonwealth parts with the 16 ft. 6 in. strip along its Parade frontage it will make it impossible to proceed with the erection of the automatic telephone exchange building as designed. I am not prepared at this stage to say that the council would be prepared to transfer to the Commonwealth land to the south of the exchange in lieu of that along East-parade; the council has not yet considered the matter. The council is, however, anxious to get this improvement, and I think if it were necessary to acquire extra land they would be prepared to do it. If the council acquired the other frontages and the Commonwealth refused to part with its land, it would give the street a very irregular appearance. Five different streets converge at this corner; there is a lot of traffic, and in its present condition the corner is dangerous.

41. *To Senator Reid.*—The land along East-parade is more valuable than that along Maesbury-street, so that the land we are asking for would be more valuable than the land at the back of the exchange. We are of opinion that if East-parade is widened it will increase the value of the land on that frontage. It will make this a better shopping area than is now possible.

42. *To the Chairman.*—The plan of the proposed building shows that there is to be a group of small buildings facing the main street, with a brick wall along the building line. I do not think that a motor garage, line store, lavatories, &c., would be an ornament to the Parade, especially as right opposite are some very nice shops. Such a proposal would be a detriment to the street; it would be objectionable, and, if possible, should be avoided.

43. *To Senator Reid.*—We have no power to regulate Commonwealth or State buildings.

44. *To Senator Lynch.*—We may have the power, seeing it is necessary to have the land on the main street to acquire land at the back of the exchange, and transfer it to the Commonwealth as compensation.

44A. *To Mr. Cook.*—In the event of the council widening the street, it would be their wish that the Commonwealth should make their frontage to East-parade as ornamental as possible.

The witness withdrew.

Llewellyn Henry Griffiths, Manager of Telephones, Postmaster-General's Department, South Australia, sworn and examined.

45. *To the Chairman.*—The intention is, I understand, to replace the present semi-automatic equipment at Unley and Norwood with up-to-date full automatic equipment. In doing this the intention is to use the dismantled equipment for smaller centres either in this or other States. In connexion with all automatic proposals traffic data is prepared by the Telephone Manager's Branch to enable the engineers to decide on the class and adequacy of the equipment necessary to perform the switching work required. Having supplied this traffic information and reviewed the development studies made from time to time the

question of estimating and providing the necessary equipment required rests entirely with the engineers. The comparative estimated costs of operating the various types of equipment under consideration by the engineers are also prepared by the Telephone Manager's Branch. The present Unley semi-automatic exchange was brought into operation on 12th April, 1919, and the present Norwood exchange on 21st June, 1919. The Unley system has recently been increased by the addition of a new unit called Hyde, which will accommodate 600 subscribers' lines. This unit was brought into operation on 31st January, 1924. The Norwood equipment has recently been increased by the installation of a new unit called East, which will accommodate 80 lines. This unit was brought into operation on 29th May, 1924. The present position regarding applicants waiting for services, &c., in the Norwood and Unley districts is as follows:—

Exchange.	Present Capacity.	Subscribers Connected	Waiting Applicants.	Average Period Waiting.	Longest Period Waiting.
Unley (including Hyde)	2,240	2,168	224	3 1/5th months	15 months
Norwood (including East)	1,760	1,735	197	3 1/2 months	18 months

It will be seen from the above that the existing capacity of Unley and Hyde and of Norwood and East has been reached, and applicants in these districts are still waiting for service. Action has been taken, I understand, to increase the equipment at these centres pending the installation of full automatic equipment, and in this connexion it is expected that equipment to take the following additional subscribers' lines will be installed at the exchanges mentioned within the next few months:—Unley, 40; Hyde, 300; and East, 240. The estimated telephone development in these districts is as follows:—

	1/1/25	1/1/30
Unley ...	3,200	5,500
Norwood ...	3,400	5,700

At the present time approximately 511 subscribers' lines in the Unley district are connected to Central Exchange, and approximately 865 in the Norwood district are also connected to Central. In view of the fact that a "full automatic" programme has been decided upon for the Adelaide metropolitan network, and that approval has already been given for the installation of full automatic equipment at Prospect, Glenelg, Brighton, Henley, and Woodville, it appears imperative that we should proceed as expeditiously as possible with the full automatic programme. A mixture of systems in any large network is, for obvious reasons, fatal to a satisfactory service. Uniformity of operation is essential, and the public should not, it is considered, be expected to perform a variety of different telephone functions in any one network. As previously explained to this Committee the reason for not providing full automatic at Norwood and Unley at the outset was that only 25 per cent. of the calls originating at those centres were for local subscribers, consequently it was not considered economical at the time to provide and maintain dials at each subscriber's premises for the purpose of operating the small number of local calls offering. When the Norwood and Unley equipment was first installed it was understood that same would be readily convertible to full automatic, but it is now found desirable and probably more economical to substitute the step-by-step principle of switches for the present system of rotary switches in operation at Norwood and Unley, thus making Unley and Norwood uniform with the other full automatic systems it is intended to install in the Adelaide network. If applicants for service in the Norwood and Unley districts are not to be held up for an indefinite period early action is necessary to install the new full

automatic equipment at those centres. The following figures show the growth of subscribers' lines, &c., in the Adelaide metropolitan area, and also for the whole State:—

STATISTICS *re* GROWTH OF TELEPHONE SERVICE IN SOUTH AUSTRALIA.

	As at 30.6.19.	As at 30.6.24.	Increase.
Number of exchanges	203	296	45.8%
Number of lines connected to exchanges	12,619	23,155	83.5%

ADELAIDE METROPOLITAN NETWORK.

	As at 30.6.19.	As at 30.6.24.	Increase.
Number of exchanges	10	16	60%
Number of subscribers' lines connected	8,625	15,101	75.1%

STATEMENT OF LINES CONNECTED TO EXCHANGES IN METROPOLITAN NETWORKS AS AT 30/6/23.

Sydney	...	50,729
Melbourne	...	38,658
Brisbane	...	11,374
Adelaide	...	13,332
Perth	...	6,833
Hobart	...	2,681

The Adelaide telephone area is the third largest metropolitan area in Australia. Development studies indicate that by 1931 there will be approximately 32,800 subscribers connected to the various Exchanges in the Adelaide metropolitan area, from which it will be seen that an extremely busy time is before the officers of the department in this State if the demands of the public for telephone service are to be adequately met during the next few years. The South Australian farmers and other primary producers are now fully alive to the importance to them, from a business, social, and medical point of view, of telephone service, and enormous telephone development is taking place in the country districts of this State. Farmers have frequently told me that the telephone, whilst placing them in touch with the markets and business centres, has also the effect of breaking down the extreme feeling of isolation that previously existed, and of making their families more contented. The future growth of the telephone business in this State (city and country) is assured, and all that is necessary successfully to carry on our large and ever-increasing business is funds, material, and a trained staff. The anticipated dates of conversion to full automatic of Exchanges in the metropolitan network are as follow—

- Prospect, Unley, and Norwood, about 1st January, 1926.
- Glenelg and Brighton, about 1st July, 1926.
- Woodville and Henley, about 1st September, 1926.
- Central, about 1st July, 1927.
- Port Adelaide and Semaphore, about 1st January, 1927.
- West Adelaide, about 1st January, 1928.

In large and growing networks containing numerous Exchanges and heavy junction traffic full automatic equipment offers advantages over the existing manual system, and to a large extent reduces operating charges and cost of buildings. The cost of buildings is apparently not on the decline, and operating charges have recently considerably increased. Any further improvement in the more modern type of C.B. manual switchboard is only likely to be obtained by the introduction of automatic features; that being so, it appears desirable to introduce the full automatic principles throughout the Adelaide network as early as possible, and, as uniformity of equipment, &c., is obviously desirable, it would appear advantageous at the outset to invite tenders to cover the whole network requirements, stipulating as one of the conditions the period during

which the work shall be undertaken and completed. The introduction of full automatic system means that the subscribers will become largely responsible for the operation of the telephone system within the metropolitan network. On present figures it would mean having, say, 1,500 operators in the network, instead of approximately 230, from which it will be seen that the success of the proposed automatic system depends largely on the degree of care exercised by the subscriber in manipulating the automatic dial, and otherwise observing the instructions issued by the department from time to time. The total permanent telephone operating staff in this state is 171 telephonists, 22 monitors, and 7 supervisors.

As regards the disposition of the present traffic staff on the completion of the proposed conversion scheme to full automatic, I do not anticipate any great difficulty in this connexion. A large number of the staff released from the operating of local calls will be absorbed in connexion with the ever-increasing trunk line business. Considerable staff additions will also be required in connexion with centralized information desks and centralized observation positions. Action has been taken to staff the large majority of country exchanges in this State with temporary telephonists, and it is intended to fill these positions with permanent officers, who will be released from metropolitan exchanges. We normally lose 24 permanent telephonists yearly, consequently (providing we employ during the last, say, two years of the manual system in Central only temporary telephonists) the whole of the permanent staff should be readily absorbed. Positions in other branches of the postal service may have to be found for a very limited number of supervisory officers, but I do not anticipate much trouble in this connexion.

STATE OF SOUTH AUSTRALIA.
PARTICULARS OF PAST DEVELOPMENT.

Year ending 30th June—	Number of Exchanges.	Number of Lines Connected.	Number of Stations Connected.	Mileage of Trunk Line Circuits.
1918	196	11,598	15,780	8,992
1919	203	12,619	17,189	9,846
1920	206	14,319	19,273	10,100
1921	218	15,984	21,480	10,249
1922	221	17,402	23,248	11,577
1923	241	19,306	25,663	12,613
1924	296	23,155	30,332	..

REVENUE.

Financial Year.	Total Earnings.	Operating Expenses.	Percentage of Operating Expenses to Earnings.	Average Percentage of Operating Expenses to Earnings whole Commonwealth.	Profit after Charging Interest on Capital.
1917-18 ..	152,496	29,007	19.02	21.16	22,658
1918-19 ..	171,843	30,531	17.77	20.25	44,000
1919-20 ..	202,829	35,979	17.74	19.98	49,668
1920-21 ..	235,269	48,679	20.69	22.22	47,891
1921-22 ..	271,881	50,966	18.75	20.9	59,975
1922-23 ..	304,061	55,069	18.11	19.92	59,018
1923-24 ..	Revenue figures are not yet available.				

It will be noticed that for every period South Australia's percentage of operating expenses to earnings is lower than the average for the Commonwealth.

If the full automatic system had been installed at Unley and Norwood, instead of the semi-automatic system, it would have been necessary to change the instruments then in use, and put in dials. After working out the economics of that question, it was found that, as 75 per cent. of the calls had in any case to go to Central, it would not pay to change all the instruments, put dials in, and maintain them. Probably it would have been preferable to have installed the manual system for the time being. In the beginning the department

fully understood that it could very readily convert the semi-automatic into the full automatic equipment, but such great progress has been made with telephonic equipment in the meantime that it is now considered wise to adopt one system, the step-by-step system, instead of the rotary system. I understand that estimates are now being prepared of the cost of bringing the whole of the Adelaide network into uniformity. It would probably cost over £1,000,000, but it could be done more economically at one time than piecemeal.

45A. *To Senator Lynch.*—I should say that it will ultimately be more economical to substitute the step-by-step principle of switches for the present system of rotary switches in operation at Norwood and Unley. But I have no definite figures on which to base that opinion. It is easier to maintain a uniform system than a mixture of systems. Difficulty is experienced in maintaining a staff trained to deal with the various types of equipment. Difficulty in such cases is also experienced in providing relieving officers. Each system has certain features that are not common to the whole of them. If we adopted one system, it would not necessarily place the Postal Department at the mercy of the manufacturers who supply the equipment for that particular system. At present we provide a clause in our provisions that makes it imperative for a contractor or tenderer for a new exchange to install a system that will work in with the existing systems. The first portion of the manual board at Central was installed by the Western Electric Company, and the next portion by the Peele Connor General Electrical Company. In calling for tenders the department stipulated that the additional equipment supplied by the Peele Connor Company should have identically the same features as the other equipment. I should say that such a clause would safeguard the department, because it would prevent the company from exercising a monopoly of any special part of the equipment. I have no doubt as to the superiority of the automatic system in large congested areas containing districts such as Unley and Norwood. In districts where the calling rate is low, the manual system would, as a rule, be the more economical. It depends largely on the class of subscribers and the size of the network. In any 10-mile area where the number of subscribers is likely within a few years to reach 30,000, the automatic system should be adopted. In many parts of the United States of America the improved manual type of board is still favoured. The San Francisco telephone exchanges, for instance, are still largely manual, but the general tendency to-day is for the old class of manual board when worn out to be scrapped, and the automatic substituted. Since it has been decided to have automatic exchanges at Prospect, Glenelg, Brighton, Henley Beach, and Woodville, I am afraid that it would muddle matters up to retain the manual system for the other suburbs. It was decided about eighteen months ago to introduce the automatic system in Adelaide, and nothing has happened in the meantime to disturb my opinion that in very large areas, it should be adopted in preference to the manual system, which could only be materially improved by the introduction of certain features of the automatic equipment, such as traffic distributors. Small country centres can best be catered for by the manual system because trunking comes largely into play there, and operators are necessary in any case.

45B. *To Senator Reid.*—When the Peele Connor Company added to the equipment installed by the Western Electric Company, it did not affect the operators; any variation from the Western Electric equipment had more to do with the circuit arrangements, than with the general design of the switchboards.

45C. *To Senator Lynch.*—There were not many competitors for the installation of our C.B. manual system, nor were there many, as far as I can remember, for the supply of semi-automatic equipment at Unley and Norwood. To-day, I would say that we would have about five possible tenderers for automatics, and it would be difficult to say whether they

were in active competition with one another. You point out to me that for the State of South Australia during the six years 1917-1923, there was practically no variation in the percentage of operating expenses to earnings, and ask me if there has been any reduction in the telephone charges. There has been no reduction in charges, and the reduction in actual profit is largely due to the variation in wages and the special payment to married men. I do not anticipate any reduction in the telephone charges, but that is a matter of policy, which concerns the central administration. In the estimate of profit after discharging interest on capital, allowance was made for depreciation.

The witness withdrew.

Clarence Edward Davies, Acting-Director of Works, South Australia, sworn and examined.

46. *To the Chairman.*—I am familiar with the plans submitted in connexion with the proposed erection of automatic telephone exchanges at Unley and Norwood. We received from the Postal Department particulars as to the size of the buildings required, and we have been in the closest collaboration with the officers of that department. The preliminary sketch plans were sent to the Chief Architect, Mr. Murdoch, who went through them with the central administration of the Postal Department in Melbourne. The working drawings and estimates were prepared in our branch. We have provided for fireproof buildings with the exception of a slight extension to the present switch rooms. The walls are to be of red brick. There are to be hollow walls and piers externally, and solid brick walls internally. The floors are of cement concrete, rendered in cement on the upper surface, and having horizontal mineral asphalt damp-courses throughout to prevent damp from affecting telephone equipment. The roofs of the new portions are semi-flat, and constructed of reinforced concrete, plastered underneath to form ceilings, and covered on top with bituminous roof covering surrounded by low parapet walls. No provision has been made for a tiled roof. You ask me if representations have been made that the heat would be great with such a roof, and that it would affect the use of the air-conditioning plant. I have heard nothing of that nature. The provision of a tiled roof would mean, roughly, an additional cost of £1,000. I do not think there is much danger of fire commencing in the overhanging eaves of the existing building. A parapet wall could be built at a cost of £500 or £600, but a better method would be to line the whole of the present eaves and soffits with plain galvanized iron to prevent sparks from any adjacent property setting fire to the building. This could be done at a cost of £100. The main switch-room now has the ceiling of small fluted galvanized iron. If the automatic plant were placed in the existing switch-room I do not think it would be liable to be affected by dust. I do not think dust would pass through the ceiling as well as the outer roof. The present Unley switch-room measures 60 feet by 36 feet, and it is to be extended to 75 ft. 6 in. by 36 feet. The air-conditioning room will be 32 ft. 3 in. by 24 ft. 6 in., including the boiler house; the battery-room, 40 feet by 24 ft. 6 in.; the power-room, 40 feet by 11 feet; the staff luncheon room 22 feet by 11 feet; the bin store, 22 feet by 10 feet; and the lavatories, 22 feet by 9 ft. 9 in. It is proposed to remove to new positions and re-use the present lineman's shed and motor garage. The estimated cost of the buildings, exclusive of the air-conditioning plant, is £5,000 at Unley, and at Norwood, £6,000. This includes electric lighting. As to the pro-

posed new building at the Norwood Exchange, facing East-parade, you asked me whether it is fair for the Government to erect a building with lavatories, and storerooms, and a plain brick wall facing a main street. This was done to make the most of the piece of land available for the purpose. I do not see any objection to the proposal. A plain brick wall looks better than many of the fences that line the streets. It is plain and simple, and I should say that it is not displeasing. I understand that the Kensington and Norwood Council desires to secure 15 feet of the East-parade frontage with a view to widening the street, but our department did not become aware of the municipal proposal until the plans for an automatic exchange had been prepared. If the Government decided to resume a piece of ground on the other side of the present telephone exchange, it would suit the department even better than the present site. It would probably be necessary only to purchase a block having a frontage from 60 to 70 feet. Provision has been made for a porch entrance, so that the attendants must pass through two sets of doors to prevent dust from entering the building. The plans provide for construction work identical with that proposed for Unley. The present switch-room at Norwood measures 60 feet by 36 feet, and it is to be extended to 73 feet by 36 feet; the air-conditioning room, including the boiler house, will be 44 feet by 30 feet; the battery room, 40 feet by 25 ft. 6 in.; the power room, 25 feet by an average of 24 feet; the staff luncheon room, 16 feet by 13 feet; the bin store, 16 feet by 15 feet; the lineman's store, 16 feet by 12 feet; the motor garage, 16 feet by 11 feet; and the lavatories, 16 feet by 9 ft. 6 in. It is estimated that the time occupied in erecting the new premises will be nine months in the case of Unley, and ten months in the case of Norwood. We have a good deal of trouble in obtaining materials, especially bricks, owing to the great building activity in the metropolitan area. The roof at Norwood will be similar in every particular to that at Unley. The old building could be made more or less fireproof by covering the present eaves and soffits with plain iron. The cottage adjacent to the building is 12 feet distant. I am looking into the matter of fire appliances for all exchanges, and I shall certainly recommend that a hydrant and hose be placed at both Unley and Norwood as a protection against fire. To make the building absolutely fireproof it would be necessary to replace the present roof.

47. *To Senator Reid.*—The only danger of fire from adjoining premises is the possibility of flames extending from the adjacent cottage to the exchange. Bricks cost about £5 per thousand, with an additional 15s. for cartage. I am not aware of any combine existing among the brick manufacturers. Ample walking space, quite 6 feet, will be provided around the proposed air-conditioning plant.

48. *To Mr. Jackson.*—If the present street alignment were moved back 15 feet a rather small three-cornered block would be left, but such a block, if required for a public building at some future date, could be used in such a way that it would not be a detriment to the neighborhood.

49. *To Mr. Cook.*—Stone is not cheaper in Adelaide than brick. There is a scarcity of stonecutters. The cost of building in Adelaide is about the same as in the other states. It may possibly be a little cheaper in South Australia. I think that our departmental costs are very similar to those in the other states. We have had to obtain increased votes to meet our growing costs, especially in the country, for it seems difficult to obtain material and men.

The committee adjourned.