

1931.

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

TELEPHONIC COMMUNICATION

BETWEEN THE

MAINLAND (VICTORIA) AND TASMANIA.

S: Authority:

H. J. GREEN, GOVERNMENT PRINTER, CANBERRA.

F.5285.

MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.
(Seventh Committee.)

ANDREW WILLIAM LACEY, Esq., M.P., Chairman.

Senate.

*Senator John Braidwood Dooley.
Senator Matthew Reid.
Senator Burford Sampson.

House of Representatives.

Malcolm Duncan Cameron, Esq., M.P.
*John Curtin, Esq., M.P.
The Honorable Henry Gregory, M.P.
*Edward James Holloway, Esq., M.P.
William John Long, Esq., M.P.
†Hubert Peter Lazzarini, Esq., M.P.
†James Thomas Tully, Esq., M.P.

* Resigned 11th March, 1931.

† Appointed 13th March, 1931.

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EXTRACT FROM VOTES AND PROCEEDINGS OF THE HOUSE OF REPRESENTATIVES, No. 85.

Dated 5th August, 1930.

4. PUBLIC WORKS COMMITTEE—REFERENCE OF WORK—ESTABLISHMENT OF TELEPHONIC COMMUNICATION BETWEEN THE MAINLAND (VICTORIA) AND TASMANIA.—Mr. Beasley (Honorary Minister) for Mr. Lyons (Minister for Works and Railways) moved, pursuant to notice, That, in accordance with the provisions of the *Commonwealth Public Works Committee Act 1913-1921*, the following proposed work be referred to the Parliamentary Standing Committee on Public Works for investigation and report :—Establishment of Telephonic Communication between the Mainland (Victoria) and Tasmania.

Debate ensued.

Question—put and passed.

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ESTABLISHMENT OF TELEPHONE COMMUNICATION BETWEEN THE MAINLAND (VICTORIA) AND TASMANIA.

REPORT.

The Parliamentary Standing Committee on Public Works, to which the House of Representatives referred for investigation and report the question of the establishment of telephonic communication between the Mainland (Victoria) and Tasmania, has the honour to report as follows:—

INTRODUCTION.

1. For the past five or six years the Postmaster-General's Department has been progressively working towards the completion of a scheme to link together all States of the Commonwealth by means of the telephone. This year a telephone service has been opened between Perth and Adelaide, thus completing the scheme as far as the mainland is concerned; leaving Tasmania as the only State isolated from the telephonic point of view.

2. Although Tasmania was brought into touch with the mainland by a submarine telegraph line laid from Cape Otway to Low Head, via King Island, as far back as 1859, until quite recent times the matter of opening a telephonic service between Victoria and Tasmania has been surrounded with almost insuperable obstacles. Modern scientific development, including progress in radio research, and particularly the improvements effected in the design of submarine cables have now made it practicable to establish this service on a satisfactory basis.

PRESENT PROPOSAL.

3. The proposal now under consideration aims at establishing a link between the telephone service of Tasmania and that of the mainland, thus enabling telephone subscribers in Tasmania to enjoy the same facilities as those on the mainland of being able to communicate by telephone with any other Australian subscriber, and, by the use of the Anglo-Australian radio link, with many countries abroad.

ALTERNATIVE SCHEMES.

4. Two means of effecting this object were suggested, namely:—
- (a) The provision of a radio telephone system; and
 - (b) The laying of a submarine cable.

(a) RADIO.

A radio telephone system would involve the erection of a transmitting station in Victoria and receiving station in Tasmania, and a transmitting station in Tasmania and its relative receiving station in Victoria. The transmitting and receiving stations in Victoria would be connected by a land line, and the transmitting and receiving stations in Tasmania would also be so connected; the four stations thus giving one complete bi-directional channel of communication. By means of appropriate apparatus the Victorian Stations would be connected to the Victorian telephone system and in the same way the Tasmanian stations would be connected to the Tasmanian telephone system.

BUILDINGS.

5. One building to house equipment and two residences for staff would be required at each transmitting and receiving station in Victoria and at each transmitting and receiving station in Tasmania—making twelve in all.

SITES.

6. A site suitable for the Victorian sending station was acquired some time ago and is located near Lyndhurst, about 29 miles south-east of Melbourne. The remaining three sites required have not yet been definitely selected, but the Tasmanian ones would probably be in the vicinity of Carrick and at or near Devonport. The other Victorian site cannot be indicated, but would be within reasonable distance of Melbourne.

(b) SUBMARINE CABLE.

7. The submarine Cable System provides for the laying of a submarine cable between a point on the Victorian coast near Lorne, and a point on the Tasmanian coast in the vicinity of Stanley, with an intermediate connexion at King Island, giving telephonic communication from King Island to both Tasmania and the mainland. The cable would contain three pairs of copper wires suitable for high quality transmission. The cable terminations would be continued to the trunk exchanges at Melbourne, Launceston and Hobart by the usual land line arrangements, and would be available for inter-connexion to the telephone systems radiating from those places.

BUILDINGS.

8. With this system it would be necessary to erect one equipment building and one cable hut at Lorne, Naracoopa, and Stanley, and one staff residence at Naracoopa (King Island).

SITES.

9. If this scheme be adopted it would be necessary to acquire small sites at Naracoopa, and at Lorne, but in the case of Stanley the existing postal site would suffice.

ESTIMATED COST.

10. The estimated cost of the two proposals, as submitted by the Postmaster-General's Department, were as follow:—

SUBMARINE CABLE SCHEME.		£	£
<i>Sites for equipment buildings and staff residences—</i>			
At Naracoopa		50	
At Lorne		200	
		<hr/>	250
<i>Buildings—Equipment buildings and cable huts—</i>			
One each at Naracoopa, Stanley and Lorne—three at £1,500		4,500	
Staff residence at Naracoopa		1,000	
		<hr/>	5,500
<i>Submarine cable—</i>			
Cable to be laid (material only) 188 nautical miles		112,800	
Laying and freight		33,000	
Spare submarine cable—15 nautical miles		9,000	
Land cable (terminals, &c.)		4,000	
		<hr/>	158,800
<i>Trunk equipment—</i>			
<i>(a) Carrier equipment—</i>			
Lorne-Melbourne		3,200	
Stanley-Launceston		3,000	
Launceston-Hobart		1,250	
		<hr/>	7,450
<i>(b) Repeater equipment—</i>			
Lorne		1,500	
Naracoopa		1,500	
Stanley		1,500	
		<hr/>	4,500
<i>(c) Associated repeater and carrier equipment—Voice frequency ringing equipment and power plant</i>			900
<i>Trunk lines—</i>			
Stanley-Burnie		2,000	
Naracoopa-Currie		1,400	
		<hr/>	3,400
Total Capital Cost			<hr/> <hr/> 180,800

RADIO TELEPHONE SCHEME.

11. Sites—Equipment buildings and staff residences—	£	£
Lyndhurst—sending station, Victoria	800	
Westernport—receiving station, Victoria	1,000	
Carrick—sending station, Tasmania	1,000	
Devonport—receiving station, Tasmania	1,000	
	<hr/>	3,800
<i>Buildings—</i>		
(a) Equipment buildings—		
Sending station, Victoria	1,600	
Sending station, Tasmania	1,420	
Receiving station, Victoria	890	
Receiving station, Tasmania	890	
	<hr/>	4,800
(b) Staff residences—		
Two at each station, i.e., eight at £1,000		8,000
<i>Radio transmission and reception—</i>		
Plant and equipment including aerials		24,840
Trunk terminal apparatus Launceston and Melbourne		4,440
Line plant and carrier equipment—		
Line plant—trunk wires	6,500	
Carrier equipment	3,250	
	<hr/>	9,750
Total capital cost		<hr/> 55,630

ESTIMATED ANNUAL CHARGES.

12. The estimated annual charges for the two systems are made up as follow:—

	<i>Submarine Cable.</i>	£
Maintenance—		
(a) Buildings		40
(b) Residence		30
(c) Submarine cable		390
(d) Trunk equipment (carrier and repeater)		1,970
(e) Line plant—trunk wires		140
Depreciation—		
(a) Buildings		60
(b) Residence		40
(c) Submarine cable		3,970
(d) Trunk equipment (carrier and repeater)		520
(e) Line plant—trunk wires (covered by maintenance charges)		
Interest on capital		10,850
Total annual charges		<hr/> 18,010
	<i>Radio Telephone Scheme.</i>	£
13. Maintenance—		
(a) Buildings		40
(b) Residences		200
(c) Plant and equipment at stations and trunk terminal equipment		10,120
(d) Line plant and carrier equipment		430
Power supply		1,810
Depreciation—		
(a) Buildings		60
(b) Residences		320
(c) Plant and equipment at stations		2,150
(d) Trunk terminal apparatus		240
(e) Line plant and carrier equipment		130
Interest on capital		3,340
Total annual charges		<hr/> 18,840

COMMITTEE'S INVESTIGATIONS.

14. The Committee took evidence from the Director-General, Chief Engineer, the Radio Engineer, and other officials of the Postmaster-General's Department; and constituted a Sectional Committee of three which visited Hobart, Launceston, Burnie and Stanley, and took evidence in those places from representatives of Chambers of Commerce, from leading business men, and others. An inspection was made of the Amalgamated Wireless Company's plant at Pennant Hills, near Sydney, and evidence obtained from the Managing Director of that Company.

NEED FOR TELEPHONE.

15. From the inquiries made by the Committee and the opinions expressed by the Chambers of Commerce, Hobart and Launceston, and leading business men, it would appear that there is a general desire on the part of a large section of the business community to have telephone connexion between Tasmania and the mainland. Representations were made that there is a feeling of isolation in Tasmania; that business operations with the mainland are to some extent hampered by the absence of means of getting promptly into personal touch with agents or customers; and that the existence of an efficient telephone service would assist in the development of trade, and generally reduce the disabilities under which business men in Tasmania labour, in comparison with others in similar walks of life on the mainland.

PROSPECTIVE TRAFFIC.

16. An endeavour was made to ascertain from witnesses the extent to which the telephone, if installed, would be likely to be used. There is a considerable community of interest between Tasmania and the mainland, and during the year an average of 700,000 telegrams, including press messages, pass between the two places.

Many of the witnesses examined stated that they would use the telephone in preference to the telegraph if facilities existed; many of those who now rely on the mail would also use the telephone. The Committee therefore has no reason to doubt that the estimates put forward by the Postmaster-General's Department will be realized. These figures show that an average of 114 calls per day may be expected during the first year, rising to 370 calls per day in the fifteenth year.

CHARGE FOR CONVERSATIONS.

17. It is the practice of the Department to charge for telephone conversations on the basis of the radial distance between subscribers, irrespective of the cost of installation of the service. On this basis the charges for conversations on the proposed line would be:—

	Charge for a Three-minute Conversation.		
	Day Rate.	Intermediate Rate.	Night Rate.
	<i>s. d.</i>	<i>s. d.</i>	<i>s. d.</i>
Melbourne-Hobart	4 6	3 5	2 3
Melbourne-Launceston	3 6	2 8	1 9
Melbourne-King Island	2 6	1 11	1 3
King Island-Hobart	3 6	2 8	1 9

ESTIMATED REVENUE.

18. At the rates mentioned, and on the amount of business anticipated, it is estimated by the Department that the amount of revenue received from the submarine cable scheme, if established, would be:—

During the—	£	£	£
First year ..	8,033	involving a loss of 9,077	
Second year ..	9,889	involving a loss of 8,121	
Third year ..	11,093	involving a loss of 6,917	
Fourth year ..	12,153	involving a loss of 5,857	
Fifth year ..	13,267	involving a loss of 4,743	
Sixth year ..	14,525	involving a loss of 3,485	
Seventh year ..	15,858	involving a loss of 2,152	
Eighth year ..	17,337	involving a loss of 673	
Ninth year ..	18,961	providing a profit of ..	951
Tenth year ..	20,805	providing a profit of ..	2,795
Eleventh year ..	21,849	providing a profit of ..	3,839
Twelfth year ..	22,893	providing a profit of ..	4,883
Thirteenth year ..	24,011	providing a profit of ..	6,001
Fourteenth year ..	25,202	providing a profit of ..	7,192
Fifteenth year ..	26,467	providing a profit of ..	8,457
			41,925
			34,118

In other investigations it has been found that the estimates furnished by the Postmaster-General's Department have closely approximated the results achieved, so that the Committee is confident that there is every possibility of the figures above quoted being realized.

19. If the increase of revenue at the same rate be maintained during the succeeding five years it may be shown that by that time the whole of the annual losses will be wiped out and a small percentage return received on the capital cost.

20. In regard to the radio telephone scheme the departmental view is that with one channel, not more than 50 effective calls a day would be possible, and the revenue derivable from this business would amount to approximately £3,530 per annum, and, unless more than one channel were installed involving considerable increase in the capital cost no more business could be catered for, and consequently no greater revenue per annum could be expected.

21. In order to inform itself on all aspects of the question, the Committee sought advice from Mr. E. T. Fisk, Managing Director, Amalgamated Wireless (Australasia) Ltd., who is probably the greatest expert in that line in the Commonwealth.

Mr. Fisk, in his evidence stated that he knew of only one recent instance in which a radio telephone had been installed over a distance similar to the one under consideration—that was the Rome-Sardinia service which was opened officially on 14th August, 1930. There are in operation other radio telephone services over longer distances, as for instance the service between Australia and London, the trans-Atlantic service, and the Australia-New Zealand service. One of the difficulties associated with establishing radio communication over short distances arises from what is called the "skip-distances" of the waves employed, which results in the message being heard more plainly at a greater distance away than at the point intended, but he expressed the opinion that, with the employment of a suitable wave-length that difficulty could be overcome. It was stated that on certain days abnormal atmospheric conditions might interfere with the service, and it was admitted that, under present conditions for telephonic purposes the advantages undoubtedly lie with the cable, in that it gives a more reliable service throughout the year. Another disadvantage to be expected from the use of the radio telephone is the lack of secrecy. It is true that by means of a voice inversion apparatus it is possible to distort speech during transit and re-invert it at the receiving end. While this guarantees a substantial measure of secrecy under normal conditions, anybody with similar knowledge and resources could listen in; and in addition, the use of this apparatus has the effect of reducing to some extent the clarity of the voice. Mr. Fisk, expressed the opinion that improvements of such a nature are likely to be made in radio telephony that it will before long be able to compete on equal terms, as far as efficiency and reliability are concerned, with cable services. He urged the installation of one of the ordinary wireless services as known to-day as being cheaper and capable of being put quickly into operation. In the course of his evidence he stated—

"Amalgamated Wireless Limited has already in Victoria sending and receiving stations employed in various services, and we would be prepared to install the necessary plant for a Tasmanian service, and operate it without the Government being involved in any outlay whatever. The Government would merely pay us for the use of our channel."

On being asked to elaborate this suggestion he subsequently wrote to the Committee intimating that, if given a contract to cover a period of ten years, his Company would be prepared to install a service of twelve hours a day, designed to carry 100 calls a day, which would involve the Commonwealth in an initial expenditure of £9,250, and an annual cost of £12,737, plus 30s. an hour for any additional hours beyond twelve per day; while for a service giving double the capacity the capital cost would be £14,750, and the annual charge £18,182, plus 40s. per hour for any additional hours beyond twelve per day.

22. The Director-General of Posts and Telegraphs, who was asked for advice in regard to this proposal, assuming that the radio service, to be comparable with the submarine cable service should be available at any hour of the 24, added to the £12,737, above-mentioned, an amount of £6,570 representing an additional twelve hours a day at 30s. per hour, and the cost of providing staff for the operation and maintenance of the terminal equipment in the trunk exchanges estimated at £3,170—thus bringing the total cost of a single channel radio service to £22,477 per annum.

On the experience gained by the Department in the operation of long distance trunk telephone lines Mr. Brown was emphatic that such single channel radio service could not possibly cope effectively with 100 calls per day. In his opinion, therefore, if the Departmental estimate of business be realized it would be necessary to provide two radio channels from the outset, and probably four channels within five years.

Furthermore, he expressed the opinion that it is not sound practice to introduce more than one authority into the operation of a unified communication service; and experience has shown that divided control is most undesirable. On the other hand the submarine cable, having three pairs of wires, would be capable of providing five channels of communication from the

outset, and might be expected to cope with all business offering for at least 25 years. In addition it would provide a channel for broadcasting purposes, and would also be available for the transaction of telegraphic business if required. Another point considered was that while a radio service would link only Tasmania with the mainland, a cable scheme would bring into more direct touch with Tasmania and the mainland, King Island, with a population of 1,200, whose residents are eager for this service and have made representations that such service would be used by the residents, would stimulate trade, assist in the development of a tourist traffic, break down the existing isolation, and increase the prosperity of the Island generally.

COMMITTEE'S RECOMMENDATIONS.

23. During the course of the investigation it was claimed by several witnesses that Tasmania, as an integral part of the Commonwealth, is entitled to enjoy the same telephone facilities as the other States. With this contention the Committee is in sympathy, and, moreover is satisfied from the evidence placed before it that the trade of Tasmania and King Island would be stimulated if these places were connected with the telephone system of the mainland. As to the method by which this could be most effectively carried out, the Committee, after carefully reviewing the evidence given by the experts in respect of each system, is convinced that the most satisfactory telephone service would be obtained from the use of a submarine cable. Such a system would give a guarantee of continuity of service and be available at all hours; greater secrecy, and is more attractive from the eventual economic aspect. From the estimates submitted by the Postmaster-General's Department, and the experience gained in respect of the growing use of other trunk line telephones, the Committee is satisfied that the loss on this service for the first year would be a gradually diminishing quantity until, from the ninth year onward, the revenue likely to be received would be sufficient to pay annual charges and return a small percentage on the capital outlay.

24. The Committee is loth to recommend at the present juncture the expenditure of any large sum of money on a public work which does not involve the employment of a great number of men and is not immediately reproductive in itself, but it is felt that there are many undisclosed benefits which would result from this service tending to increase the revenue in indirect ways which, if they could be calculated, would show this project as an even better financial proposition than it now appears. When funds can be conveniently made available therefore, the Committee is unanimous in recommending that a submarine telephone cable be laid from Lorne, via King Island, to Stanley, on the lines suggested by the Postmaster-General's Department for the purpose of connecting the telephone systems of Tasmania and the mainland.

BUILDINGS.

25. It was stated in evidence that with a submarine cable scheme it is proposed to establish terminal stations at Lorne, King Island, and Stanley, and also a staff residence at King Island. The terminal buildings are proposed to be of brick with tiled roofs and concrete floors, and of a size 51 feet long by 21 feet wide, with a height of 12 feet from floor to ceiling. They will provide accommodation for a battery room, power room, apparatus room, and store room. The estimates obtained by the Committee of the cost of these buildings were: Lorne £840, King Island £1,075, and Stanley £840. The staff residence at Naracoopa, King Island, is designed to comprise a living room 18 feet by 15 feet, front bedroom, 16 feet by 13 feet, second bedroom, 13 feet by 10 ft. 6 in., third bedroom, 13 feet by 10 feet, kitchen, 12 feet by 10 feet, bath room, 9 feet by 7 feet. It is proposed to be constructed of timber, and is estimated to cost £1,480.

In view of the fact that no water supply exists at Naracoopa, the Committee recommends that this building be constructed of brick or concrete rather than timber as providing greater security against fire and requiring less cost for upkeep. If constructed of brick the Committee was informed that the cost would be approximately £1,680.

The original estimate submitted for these buildings was £5,500; those recommended by the Committee would cost approximately £4,435—a saving of £1,065.

A. W. LACEY,
Chairman.

Office of the Parliamentary Standing Committee on Public Works,
Parliament House, Canberra.

16th April, 1931.

MINUTES OF EVIDENCE.

(Taken at Canberra.)

WEDNESDAY, 12TH NOVEMBER, 1930.

Present:

Mr. LACEY, Chairman;

Senator Dooley	Mr. Curtin
Senator Reid	Mr. Gregory
Senator Sampson	Mr. Holloway
Mr. M. Cameron	Mr. Long.

Harry Percy Brown, Director-General of Posts and Telegraphs, sworn and examined.

1. *To the Chairman.*—I am aware that the Parliament has requested the committee to investigate the proposal for the establishment of telephonic communication between Tasmania and the mainland. This project was part of the policy of the late Government for five or six years. We set out with the intention to provide a telephone network throughout the Commonwealth, and within the next month or so the last link on the mainland—that is between Adelaide and Perth—will be completed, leaving Tasmania the only isolated State from the telephonic point of view. Difficulty has been experienced in going ahead with the Tasmanian proposal more recently because of the financial situation. The matter was revived some months ago, and finally it was decided that the case had better be submitted to Parliament in the hope that it would come before this committee, which might express its view on the desirability of adopting one of two alternative schemes. Whether funds will be available for the project is quite another matter. I have prepared the following statement on the subject:—

The proposal is to establish telephone service between the mainland and Tasmania by the adoption of one or other of two schemes based on—

- (a) the provision of a radio telephone system;
- (b) the provision of a submarine cable.

2. There is at present no means for telephoning between Tasmania and the mainland and on this account Tasmania suffers a disability as compared with other parts of the Commonwealth. The establishment of the service under consideration has been a portion of the policy of the department for the past four or five years, which contemplated the linking together of all parts of the Commonwealth by a telephone network. The scheme has been steadily developed and within the next month or so it is anticipated that the last important link on the mainland, namely, that between Adelaide and Perth, will have been completed. For the time being, therefore, Tasmania is the only State of the Commonwealth which remains isolated telephonically from all other States. There is a substantial community of interest between Tasmania and the mainland as will be evident from the fact that the average number of telegrams outwards from and inwards to Tasmania totals 248,000 and 252,000 per annum respectively. The total telegraph press traffic, additional to the foregoing, averages about 43,000 messages, equivalent to approximately 200,000 telegrams per annum.

3. It is believed that the telephone services will be of much public benefit and will facilitate the conduct of business. It will have a considerable social value and it will assist in the development and prosperity of the island State. There have been substantial advances in connexion with both radio telephony and submarine cable telephony in recent years, as a result of which a service of the character of that now in question can be made available with greater certainty than was the case only a short time ago.

4. The project has been studied with a view to determining the advisability of adopting one or other of the alternatives (a) radio equipments, (b) submarine cable.

5. The merit of the radio scheme is the lower initial cost entailed in establishing an individual channel of communication. From other points of view a radio service suffers in comparison with the cable service for the following reasons.

6. Its operation is likely to be irregular consequent on the changing natural phenomena which affect all radio transmission over a distance. It is not to be expected that service would be available over the full period of 24 hours and this

may prove to be an important factor in the establishment of communication between Tasmania and places outside the Commonwealth which will be reached by radio services available only during certain hours of the day. If the hours of service do not coincide over the two links to be interconnected, then overseas service would be impracticable from Tasmania.

7. In ordinary circumstances a radio channel is not secret, although supplementary devices may be used which practically eliminate the possibility of the novice listening to conversations. Such devices, however, have a degrading effect on the transmission and necessarily tend to reduce the hours of effective service.

8. If the volume of traffic offering were greater than that which could be carried by a single channel, heavy additional expense approximating the cost of the original installation would be entailed, if one further channel had to be provided.

9. Owing to the variability and absence of continuity of service, the carrying capacity of a radio channel is invariably less than that of a circuit provided by aerial line or cable.

10. In regard to a submarine cable scheme, the initial cost is, unfortunately, considerable, and this is the chief drawback. The working expenses, however, apart from depreciation and interest, are comparatively small.

11. From the service stand-point the cable offers quite definite and appreciable advantages. The quality of transmission is uniformly good, the service rendered is stable and continuous, and the conversations are practically immune from overhearing by eavesdroppers. There is, of course, the liability of interruption from physical failure or damage of the cable. It is reasonable to anticipate that the occasions on which faults of this character would develop would be extremely rare, but it has to be recognized that when a fault occurs on a cable under the sea, it may dislocate the service for an appreciable period, depending on the time it takes to get a repair ship to the locality and on the weather conditions prevailing.

12. Although the initial cost of a submarine cable scheme providing for only one channel of communication is high, a comparatively small increase in expense is incurred in providing additional conductors in the original cable which can be held in reserve to meet the growth of traffic. It is the invariable experience of telephone practice that when two centres of population, having substantial numbers of people, are connected together telephonically, there is a rapid growth in the traffic. In the case of the Tasmanian service there is little doubt that the business would expand within a very brief space of time beyond the carrying capacity even of a physical cable circuit. Provision has been made in the cable scheme now under consideration for three pairs of conductors, which, by super-position, will give five distinct duplex channels of communication. It will be practicable to use the circuits for telephone purposes; for interconnecting broadcasting stations on the mainland with those in Tasmania; and for telegraph purposes.

13. Particulars of the two schemes are briefly as follows.

14. *Radio Telephony.*—Radio telephone communication requires an outward and an inward channel, and at the point of interconnection with the telephone network, special apparatus must be available to combine the two uni-directional radio channels into a single bi-directional channel for connexion to the trunk lines and telephone subscribers' circuits.

The proposal under consideration provides for—

- (a) A radio transmitting station in Victoria and a corresponding receiving station in Tasmania.
- (b) A radio transmitting station in Tasmania and a corresponding receiving station in Victoria.
- (c) Special terminal apparatus for the trunk exchanges at Launceston and Melbourne needed to interconnect the radio channels with the trunk and subscribers' circuits.
- (d) Interconnecting lines between the transmitting and receiving stations in each State and the relevant trunk exchanges, namely, Melbourne and Launceston.

15. The estimated capital cost of the scheme is £36,000, and the annual charges £19,000.

16. An estimate has been made of the volume of traffic which may be anticipated if unrestricted efficient service were available. In the first year it may be expected that the calls would average 100 per day, reaching a total of 170 at the end of the fifth year and 272 at the end of the tenth year. The figures for the first year are in excess of the carrying capacity of a single radio channel, and it is not anticipated that in average circumstances more than 50 calls per day can be disposed of. Basing the charges on the usual radial mileage distances, the revenue would amount to about £3,500 per annum.

17. *Submarine Cable Scheme.*—The proposal provides for the laying of a submarine cable between a point on the Victorian coast near Lorne, and a point on the Tasmanian coast in the vicinity of Stanley, with an intermediate connexion at King Island, giving telephonic communication from King Island to both Tasmania and the mainland. The cable will contain three pairs of copper wire suitable for high quality transmission. The cable terminations will be continued to the trunk exchanges at Melbourne, Launceston and Hobart by the usual land-line arrangements and will, of course, be available for interconnexion to the telephone systems radiating from those places.

18. The circuit provision in the cable will permit of a variety of uses—for ordinary telephonic conversations; for broadcasting purposes; or for the transaction of telegraph business—and the allocation of the circuits to the various needs can be determined from time to time, based on the extent of traffic to be dealt with under each one of these three headings. The design of the cable will be such that a maximum of five independent channels could be provided for telephone conversation.

19. The estimated cost of the submarine cable scheme, including all the terminal, repeater, and land line requirements, is £181,000 and the estimated annual charges total £19,000.

20. The intermediate connexion to King Island will, of course, bring additional business to the services. The average number of daily calls anticipated is 114 in the first year, increasing to 187 in the fifth year and 292 in the tenth year.

21. The whole of this traffic could be dealt with conveniently on the circuit provision made in the projected cable, and the estimated revenue thus amounts to a total of £8,033 in the first year, £13,207 in the fifth year, and £20,805 in the tenth year.

22. The committee will doubtless wish to know the attitude of the department to the two schemes. From a purely business standpoint there appears little doubt that the cable would prove less burdensome financially as a working concern and would be more advantageous from all points of view to the telephone using public, both in Tasmania and on the mainland. The question of initial cost is an important factor, however, particularly in the present national circumstances. If, for instance, the large sum of money needed for the cable scheme could not be made available within a reasonable time, whereas the provision of the smaller sum might be practicable, it is conceivable that the public would prefer the half loaf as being better than none in the immediate future, hoping that circumstances would change in their favour and bring into being the more comprehensive system before many years had elapsed.

23. Nevertheless, it has to be borne in mind that if the less costly scheme is entered upon it cannot lightly be abandoned, and its existence may, therefore, delay the realization of the comprehensive plan which, sooner or later, will be the inevitable solution.

We sought an intermediate point at which the cable could be terminated, and selected King Island. Lorne and Stanley are the nearest places, and after an examination it was found that the conditions were quite satisfactory for landing purposes. The distance from Wilson's Promontory to Bridport may be shorter, but we wished to avoid the route now taken by the two existing cables. A survey of the sea bottom is also an important consideration. A study has been made of the charts, and we feel that the Lorne-Stanley route is quite as good, if not better, than any other. Wilson's Promontory is an awkward place to get at for land line purposes, whereas Lorne provides a satisfactory route. I have no doubt in my own mind that the submarine cable affords the better solution of the problem. Having regard to all the research work being undertaken throughout the world, one expects that radio communication will improve, but there are certain fundamental considerations that make it extremely unlikely that it will provide the same degree of reliability and continuity of service as is obtainable by means of the cable. May I refer to a project in hand by one of the largest and most competent authorities in the world? I speak of the American telephone and telegraph organization which is now engaged in the laying of a submarine telephone cable across the Atlantic. In conjunction with the British Post Office, these authorities have had great experience in radio communication. At present, there are four separate channels operating across the Atlantic. The first has now been in service, perhaps, five years, and in spite of that, and the fact that the cable may cost a couple of million pounds, these authorities have decided on the desirability of

laying a submarine cable. You ask me for instances of the establishment of radio telephonic services recently. There are the linking of Australia and the United Kingdom, and the present attempts to establish telephone services between the Commonwealth and New Zealand and Java. There is a radio service across the Atlantic, and Holland has one of a number of other long distance telephone services. Up to a point, these are satisfactory. The service from Australia to Great Britain, for instance, is an extremely valuable one, but it is subject to very long periods of interruption when it is impracticable to effect communication. On Sunday, we were particularly anxious for the honorable the Acting Treasurer (Mr. Lyons) to converse by wireless telephone with the Prime Minister (Mr. Scullin). Mr. Lyons stood by from 5 p.m. to 1 a.m. on Monday. That is a period when in average circumstances we are able to establish communication, but on this occasion we were unsuccessful. A submarine cable telephone over a considerable distance is a comparatively new thing. Perhaps not more than eight or ten years have elapsed since this has been found practicable. I was associated with the laying of the first telephone cable across the English Channel in about 1903 or 1904. Since then a number of these cables have been laid across the North Sea, and the distances are approximately those with which we are now dealing. We have specially set out to break the proposed cable between Tasmania and the mainland into two sections by landing it at King Island. Each section may be regarded as an independent unit, because the transmission from the Mainland to King Island can be amplified and sent on the next link as though it had originated on King Island. The Anglo-Dutch cable is 82 nautical miles in length. There is, among others, a cable in Norway 162 miles long, and another in East Prussia, 117 miles long. If a radio installation were decided upon, I should say the greater portion of it could be manufactured in Australia, but in the event of a submarine cable being recommended, practically none of the work could be carried out in this country. The site for a radio station at Lyndhurst was acquired two years ago and cost about £1,600. This site was partly intended for the Victoria-Tasmania telephone service. Even if a radio service is not decided upon, in all probability the department will find that site useful. After receipt of approval of any scheme, from twelve to eighteen months would elapse before the work could be completed. In the event of a radio service being chosen, probably a contract would be let for the supply of the equipment, and the contractor would find the whole of the labour for its instalment, or he would provide a supervising engineer and use departmental labour. In the event of a submarine cable being provided, this would have to be brought from overseas on a cable ship, and the expert staff on the vessel would lay the cable. We propose to base the charge for telephone conversations on the radial mileage system that applies to all conversations throughout the Commonwealth, making the charge exactly the same as it would be if Launceston and Melbourne were connected by land lines.

2. *To Mr. Curtin.*—The practice of the department is to charge for a trunk line conversation only from the moment at which the two subscribers enter into conversation. The explanation of the difference between the estimated revenues of £3,500 and £3,000 for radio and submarine cable services respectively in the first year is that owing to the characteristics of a radio channel, it is impossible to obtain the same degree of efficiency as from a stable conductor, whether aerial or cable. Our estimate of the total volume of traffic to be put through on an average radio link is 50 calls per day, whereas with a cable and a single conductor twice that number of calls could be dealt with. As we propose to use three pairs of wires in the cable, the

radio channel suffers much further by comparison. We believe that if there were an unrestricted and efficient wireless service, we could get 100 calls per day in the first year, but owing to the limitations of radio transmission, we do not think that we could put through more than 50 calls per day by that means. Therefore, a radio installation would not provide the service likely to be demanded. A single radio channel could not meet the estimated requirements of the first year, and our common experience is that once a service is granted the demand for it increases at a rapid rate. From a submarine cable service, the department could look for a steadily increasing revenue, but not from a radio service unless it provided an additional channel which would cost nearly as much as the original installation. It would not be essential to have a cable ship in Australian waters if a submarine cable were laid. We are fortunate in that respect because there are a good many cables radiating from Australia, and the companies responsible for them maintain a cable ship in Australasian waters. We have used that vessel twice in connexion with the maintenance of our cables. The department has all the necessary gear at the present time for repairing a cable. This is held at a convenient place, and can be put on any vessel such as the *Hygeia* at short notice. The sum mentioned in my report as the total annual charges in connexion with a submarine cable scheme comprises maintenance, depreciation and interest on capital. The estimated cost of the two proposals is shown in detail in the following statement:—

TASMANIAN TELEPHONE COMMUNICATION.

SUBMARINE CABLE SCHEME.

Details of Estimated Capital Cost—

Sites—		£	£
Equipment buildings, and staff residences—			
Naracoopa	50		
Lorne	200		250
Buildings—			
(a) Equipment buildings and cable huts—			
One each at Naracoopa, Stanley, and Lorne, at £1,500 each			4,500
(b) Staff residence—			
One at Naracoopa			1,000
Submarine Cable—			
Cable to be laid (material only), 188 nautical miles	112,800		
Laying and freight	33,000		
Spare submarine cable, 15 nautical miles	9,000		
Land cable (terminations, &c.)	4,000		158,800

Trunk Equipment—

(a) Carrier equipment—			
Lorne-Melbourne	3,200		
Stanley-Launceston	3,000		
Launceston-Hobart	1,250		7,450
(b) Repeater equipment—			
Lorne	1,500		
Naracoopa	1,500		
Stanley	1,500		4,500
(c) Associated repeater and carrier equipment—			
Voice frequency ringing equipment and power plant			900
Trunk Lines—			
Stanley-Burnie	2,000		
Naracoopa-Currie	1,400		3,400

Total capital cost 180,800

Details of Estimated Annual Charges—

Maintenance—		£	£
(a) Buildings		40	
(b) Residence		30	
(c) Submarine cable		399	
(d) Trunk equipment (carrier and repeater)		1,976	
(e) Line plant—trunk wires		140	

Depreciation—		£	£
(a) Buildings		60	
(b) Residence		40	
(c) Submarine cable		3,970	
(d) Trunk equipment (carrier and repeater)		520	
(e) Line plant—trunk wires (covered by maintenance charges)		—	
Interest on capital			10,850
Total annual charges			18,010

RADIO TELEPHONE SCHEME.

Details of Estimated Capital Cost—

Sites—		£	£
Equipment buildings, and staff residences—			
Lyndhurst—sending station, Victoria	800		
Westernport—receiving station, Victoria	1,000		
Carrick—sending station, Tasmania	1,000		
Devonport—receiving station, Tasmania	1,000		3,800
Buildings—			
(a) Equipment buildings—			
Sending station, Victoria	1,000		
Sending station, Tasmania	1,420		
Receiving station, Victoria	800		
Receiving station, Tasmania	800		4,800
(b) Staff residences—			
Two at each station, viz., eight at £1,000 each			8,000
Radio Transmission and Reception—			
Plant and equipment, including aerials			24,840
Trunk Terminal Apparatus—			
Launceston and Melbourne			4,440
Line Plant and Carrier Equipment—			
(a) Line plant—trunk wires	6,500		
(b) Carrier equipment	3,250		9,750
Total capital cost			55,630

Details of Estimated Annual Charges—

Maintenance—			
(a) Buildings	40		
(b) Residences	200		
(c) Plant and equipment at stations and trunk terminal equipment	10,120		
(d) Line plant and carrier equipment	430		
Power Supply			1,810
Depreciation—			
(a) Buildings	60		
(b) Residences	320		
(c) Plant and equipment at stations	2,150		
(d) Trunk terminal apparatus	240		
(e) Line plant and carrier equipment	130		
Interest on Capital			3,340
Total annual charges			18,340

The sum of £390 is allowed for the annual maintenance charge on the cable itself, and we think that in ordinary circumstances that is sufficient. The route followed by the cable would be a safe one where it would not be likely to suffer damage through chafing on reefs, and where ships would be unlikely to drag their anchors across it. We propose to land the cable on the east coast of King Island at Naracoopa, some sixteen and a half miles distant from Currie, which is on the western side. Some 170 subscribers on the island would have access to the cable, which would go in and come out at the same point.

3. To Mr. Holloway.—If a radio telephone system were adopted, it would be necessary to have a considerable staff standing by for a good deal of the time to keep the apparatus in operation, whereas a submarine cable provides a physical circuit, forming a portion of the telephone network, nobody being required for maintenance duties, apart from the ordinary repeater equipment which is an installation on all long distance circuits, whether aerial or underground. If anything approaching the estimated demand for service were realized, a radio telephone service would eventually cost very much more than a submarine service.

It would cost as much annually for one radio channel indifferent in quality and carrying capacity, as, for say, five telephone channels through a cable. It would be necessary to install a second radio channel almost from the outset, if the business offering were to be dealt with, and that would almost double the cost of the original installation. From a business point of view a radio service cannot be recommended. It would be impossible economically to manufacture submarine cables in Australia; this is a highly specialized engineering job, and even the United States of America itself has not attempted to make them. The cables used by the United States of America are manufactured in Britain, and it is almost certain that the Atlantic cable will be made there. Attacks by marine insects, such as the teredo, can be resisted by the employment of a brass tape which is wound round the insulating material. I should not anticipate any difficulty in obtaining a tender from a British firm for the laying of a cable from Victoria to Tasmania.

4. *To Mr. Long.*—In our estimate of the volume of traffic the department has taken into consideration the emphatic view of large numbers of business people that telephonic communication between Tasmania and the mainland will be of great value to them. I regard the establishment of either one of the two systems referred to as justified. The proposed radio service could not be increased on a single channel, but if we knew at the outset that the erection of a number of channels was contemplated, the purchase of the sites and of certain portions of the equipment could be made on such a basis that each additional channel would not necessarily cost as much as the original. Having regard to the anticipated traffic the proposal for a submarine cable is preferable to a radio channel.

5. *To Senator Sampson.*—From a business point of view the better proposition would be to lay a submarine cable. Even under the most favorable conditions a wireless telephone service would be subject to interruption. I think that a cable would prove the only ultimate solution. A wireless service would be a temporary one at best, because it would not be able to handle the traffic that is expected to develop. Therefore, the more costly scheme at the outset would be the more economical in the end.

6. *To Mr. M. Cameron.*—A wireless telephone service does not give the same degree of reliability as a cable service, because it is subject to fluctuations due to natural phenomena, which at the present time we cannot control. Take the wireless telephonic service across the Atlantic. In order to obtain a degree of continuity, a multiplicity of wave lengths is employed; the service cannot be kept operating on a single wave length. During the hours between 10 p.m. and 1 a.m., on the best wave lengths selected for that period, the percentage of commercial time is 60. That means that for 40 per cent. of the time, under the best conditions, a service cannot be obtained, although there has probably been greater concentration of effort in regard to the Atlantic service than with respect to any other in the world. From 1 a.m. to 7 a.m. for only 60 per cent. of the time is a commercial service possible, using the most suitable wave length for that period. Between 11 a.m. and 3 p.m., using another wave length again, a maximum of 90 per cent. is obtained. The distance is approximately 3,000 miles. Generally speaking, the same natural phenomena which cause delay in the service across the Atlantic would be experienced between Tasmania and the mainland. The distance is shorter, and in some respects that simplifies the problem, but in other respects it probably increases the difficulties. The quality of the conversation is an extremely important matter in getting business through. If it is found necessary to ask for the repetition of words or sentences

missed, the ineffective time becomes great. In the service from Australia to the United Kingdom we have to keep an extremely careful watch on the quality of the conversation, so that we can make allowance for the very brief periods of, perhaps, twenty or thirty seconds when a flick will often prevent a conversation from being intelligible. We experience all conceivable conditions from as perfect a transmission of speech as possible until the voice is unintelligible. It is common to be receiving perfect speech, and for flicks to occur in the middle of it which make it impossible to carry on. For a second or two the volume may be lost, and then the voice may come up with a roar again. Wireless telephonic conversation is still improving, but wave propagation is so complicated a matter that one would hesitate to prophesy. I should say that the likelihood of having anything approaching the reliability of a physical circuit is extremely remote. The great difference between the annual cost of the alternative proposals, which is the all-important consideration, is that if a radio installation is to operate for 24 hours a day, a staff is required at each of four points to keep the plant operating. Transmitting and receiving stations would be required both in Tasmania and on the mainland, and they would have to be staffed for 24 hours. Three skilled mechanics would be required at each station, and that would mean the employment of twelve men straight away. But when a cable is laid it requires practically no attention. There is no big consumption of power and nothing like the adjustments that are required in connexion with radio telephony. I should think that it would take three or four months to manufacture a submarine cable suitable for a service between Tasmania and the mainland. A couple of years might pass if the installation were undertaken leisurely, but if necessary, there should be no difficulty in carrying it out within eighteen months.

7. *To Mr. Gregory.*—Absolute secrecy is impossible with wireless telephony at the present time, but in the service operating between the Commonwealth and the United Kingdom we are using voice inversion equipment which introduces a substantial measure of secrecy. Anybody with similar knowledge and resources could listen in. If I were now considering the establishment of a telephone service between Adelaide and Perth, and if I considered the matter from the point of view of the balance-sheet of the Post Office I should not recommend it, but, having regard to the national benefit, I might be disposed to support it. Tasmania has an efficient telegraphic service at the present time. From the Treasury point of view, a work estimated to cost £180,000 and returning only £3,000 in revenue for the first year, may not commend itself, but considering the benefit that may ultimately accrue to the nation through the increase in the prosperity of Tasmania and the mainland, I would be in favour of the project, because nothing contributes more to the prosperity of a new country, particularly, than an adequate system of communication.

8. *To Senator Dooley.*—Approximately 250,000 ordinary telegrams are sent each year between Tasmania and the mainland every way, and, including press telegrams, the total number transmitted annually would be about 700,000. I think that the establishment of a telephone service would slightly reduce that number. We have based our estimates on the telephone proposal alone, but we should lose in all probability a certain amount of telegraph business, assuming that the commercial position of Australia remained the same. I say definitely that the submarine cable that would be required for this service could not be made in Australia. It would have a diameter of about 14 inches; there would be solid conductors, and they would be continuously loaded with one of the alloys that are

necessary to give good quality transmission. Then the wires would be insulated with some substance like gutta percha or paper; they would be twisted together, put into brass tape, and made up into cable formation with a lead sheath; on top of that would be compound, then yarn, and finally steel stranding wires. The total estimated cost of the cable work is £158,000. If the United States of America cannot make its own submarine cables, I do not think that Australia could profitably do it; but, of course, it could be done at a price. The only cables we have made here, so far, are the simplest ones, consisting of copper wires insulated with paper, twisted in ordinary formation and put into a lead sheath. These are made exceptionally well here, but would be unsuitable for submarine purposes. Submarine telephone cable needs extraordinary uniformity of characteristics, and its manufacture represents the last word in scientific development. I have not consulted any cable manufacturers on this subject. I believe that there are only about three firms in Great Britain capable of doing the work. Practically the whole of the equipment necessary for a wireless installation could be made here.

9. *To Senator Reid.*—There has been a great improvement in the last few years in the continuity of service provided by wireless. A few years ago it was possible to send only on long wave lengths, and the signals were subject to much interference on account of statics. Development has taken place as the result of short wave working, and this has greatly reduced interference. With a short wave system we can employ a directive aerial, which shuts out a lot of atmospheric energy and concentrates the energy in the desired direction. That cannot be done in long wave working. Then again, the use of short wave transmission enables us to take advantage of a very much larger proportion of the power put into the aerial; the increase may be from 10 per cent. on the long wave to 70 per cent. on the short wave. Research in this direction is proceeding throughout the world. We have men especially engaged in Australia on wireless investigation work, but we are, to a great extent, still groping in the dark. If you ask me whether I think that the advance likely to be made within the next two years would be sufficient to induce the committee to wait for a wireless service to Tasmania, I should say "no." Great advance has been made within the last few years, and the equipment available to-day offers a good quality of service apart from interruptions due to natural causes. The present cable service to Tasmania is satisfactory from a telegraphic point of view. Like all other communication and transportation systems, it has heavy peak loads, and a certain amount of traffic delay is unavoidable. If the cables were continuously in use, their capacity would be enormously in excess of the business now going through, but the peak loads determine the carrying capacity of a system, and at present these cables are being used almost to their full extent. We have endeavoured to induce the public to distribute the business more evenly throughout the day by the imposition of differential tariffs so far as the trunk system is concerned.

10. *To Mr. Curtin.*—The percentage of lettergram business to other telegraphic business from Western Australia to the eastern States, where the time is different, is very much greater than in those States in which the time is the same. There is a definite sphere for telephonic as distinct from telegraphic services. The establishment of a long distance telephonic service is often accompanied by an increase in the telegraphic traffic, but over short distances the reverse is the case. The telephone gives personal contact, and where the charge is comparable to the telegraph rates, it is often preferred. I do not wish to convey the impression to this committee that I

do not regard wireless telephony as a useful means of establishing communication. I have to consider the proposal as a business project from the point of view of the department, and having regard to the interests of the community. It is not for me to decide whether it would be a good thing to use a wireless installation that could be made in Australia in preference to a submarine cable which would have to be imported from overseas; that is a national question for somebody else to decide. My evidence is based entirely on the commercial and technical aspects of the two proposals.

11. *To Senator Reid.*—Regarding the problem purely from a business point of view, I should not recommend either of the proposals, but there is a wider issue in all these departmental matters. If either system were adopted, we should lose money for a number of years, and we should lose more on a radio service than on a cable service.

12. *To Mr. Holloway.*—The latter statement holds good, irrespective of whether the installation is made immediately or when better times return. Our estimate has been framed with regard to normal conditions. Many post office services have been established throughout Australia with the full knowledge that they cannot be remunerative.

(Taken at Canberra.)

THURSDAY, 13TH NOVEMBER, 1930.

Present:

- Mr. LACEY, Chairman;
- Senator Dooley
- Senator Reid
- Senator Sampson
- Mr. M. Cameron
- Mr. Curtin
- Mr. Gregory
- Mr. Holloway
- Mr. Long.

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

13. *To the Chairman.*—I am aware that the proposal to establish telephone communication between Tasmania and the mainland has been referred to this committee. I was concerned in the preparation of the details of the proposals. A telephone service between Tasmania and the mainland may be provided by the installation of either of the following two systems:—

Submarine Scheme.—Five two-way telephone channels by means of a submarine telephone cable between Victoria and Tasmania, of which two will be immediately equipped.

Radio Scheme.—One two-way telephone channel by means of a radio telephone system, with sending and receiving stations in Victoria and Tasmania.

No facilities at present exist for the transmission of speech between the residents of Tasmania and the mainland. Technical difficulties have in the past made the provision of this service impracticable. Scientific advances and improvements in electrical communication engineering have, however, now enabled these difficulties to be surmounted sufficiently to make possible the establishment of such a service, which could be given either by means of a specially designed submarine cable or by the establishment of a radio system. The estimated costs and annual charges of the alternative schemes are as follows:—

	Estimated Cost £	Annual Charges £
<i>Submarine cable system—</i>		
Two (immediately), and capacity for five telephone channels (two-way)	180,800	18,010
<i>Radio system—</i>		
One telephone channel (two-way)	55,630	18,840

Estimated revenue—	Submarine Cable System.	Radio System.
	£	£
1st Year	8,033 ..	3,530
5th Year	13,267 ..	3,530
10th Year	20,805 ..	3,530

In order that the relative merits of the two systems may be considered, each of the respective schemes is submitted as a distinct proposal. The alternative schemes do not admit of strict comparison, because of the different facilities provided. A radio system of five channels is not immediately necessary, and would be impracticable on financial grounds; and, on the other hand, to lay a single channel cable would be unwise and uneconomical, as the cost of laying is a large item, and this cost does not vary appreciably with the number of channels (within limits) which the cable would provide.

SUBMARINE CABLE SCHEME.

The proposal is to establish telephone facilities between the telephone system serving the mainland and Tasmania, by means of a submarine cable laid between Lorne on the southern Victorian coast and Stanley on the northern coast of Tasmania, a direct distance of approximately 153 nautical miles. The cable will, however, connect with King Island at Naracoopa on the east coast of the island, and with the loop in to King Island the distance is approximately 167 nautical miles. The cable will consist of three pairs of copper wires, "continuously loaded". Allowing for variations in the level of the sea bottom, and also deviations from course when laying, the length of cable required is estimated at 188 nautical miles. The cable will be connected to the mainland long distance telephone system at Lorne, and to the Tasmanian long distance telephone system at Stanley. It will be necessary to acquire small sites at Naracoopa, King Island, and at Lorne, but in the case of Stanley, the existing postal site will suffice. At Lorne (Victorian end), Stanley (Tasmanian end) and Naracoopa (King Island) it will be necessary to provide suitable buildings to accommodate the carrier and repeater equipment, and these will be built of brick or reinforced concrete. At Naracoopa it may be found necessary to provide a residence for the maintenance officer, as other accommodation may not be available there. The necessary amount for this has been included in the estimate. The estimated immediate capital cost is:—

Sites (Lorne and King Island)	£ 250
Trunk equipment (carrier and repeater)	4,500
Residence at Naracoopa	1,000
Submarine cable (including laying and termination)	158,800
Trunk equipment (carrier and repeater)	12,850
Trunk lines	3,400
	<hr/>
	180,800

The annual charges for the submarine cable service are estimated to be £18,010.

The revenue has been estimated on the radial tariff basis. The estimated revenue is as follows:—

	King Island.	Tasmania.	Total.
	£	£	£
1st Year	758 ..	7,275 ..	8,033
5th Year	809 ..	12,368 ..	13,267
10th Year	1,017 ..	19,788 ..	20,805

RADIO TELEPHONE SCHEME.

As an alternative to the cable scheme, this proposal contemplates a system of radio telephony across Bass Strait, providing telephonic inter-communication between the subscribers in Tasmania and those on the mainland. Radio transmission is fundamentally uni-directional, whereas conversation is essentially bi-

directional. Therefore, if two persons are to converse over a radio system, it is necessary to provide two channels—an outward and an inward, i.e., one for each "half" of the conversation. At each terminal special apparatus must be provided to combine the two uni-directional channels into one bi-directional channel capable of being connected to the ordinary trunk lines and subscribers' telephones, since these operate on a bi-directional basis. The proposal under this scheme, therefore, provides for:—

- A radio sending station in Victoria, and its receiving station in Tasmania.
- A radio sending station in Tasmania, and its receiving station in Victoria.
- Special terminal apparatus in the Melbourne trunk line telephone exchange, and in the Launceston telephone exchange to inter-connect the radio channels with the trunk and subscribers' lines.
- Wire lines to join the radio stations with their respective terminals. To secure efficient radiating and receiving conditions, it is necessary to locate the radio stations some distance from towns and to separate the two stations of a terminal by several miles.

The power rating of such sending station will be 1½ kilowatts of carrier wave power in the aerial. The primary electric power supply for each station will be obtained from the transmission lines of the power supply authorities in each State. At present, radio telephonic conversations are not secret. It is technically possible to design special additional apparatus that "inverts" speech passing over the radio portion of the link, so making it unintelligible to an eavesdropper, unless he possess elaborate apparatus capable of "re-inverting" it. Not only are there difficulties to be overcome in the design of the secrecy apparatus itself, but also the use of it tends to reduce the hours of effective service; that is to say, there may be certain periods during which satisfactory non-secret service can just be continued, but the addition of the secrecy apparatus would cause the service to become unsatisfactory. Since it would be more or less guess-work to estimate the cost of an efficient secrecy arrangement, the apparatus for this requirement has not been included in this proposal. The specifications to which tenders are to be invited, will, however, contain provision for the addition of secrecy apparatus, and tenderers will be asked to quote prices for any such equipment that they may have developed. Owing to natural phenomena such as sunspots, magnetic storms and electrical variations and disturbances of the upper atmosphere, the radio service will be subject to irregularities. It is expected that, under average conditions, service will be maintained satisfactorily during the greater proportion of the hours of each day; experience with short-wave telephone service indicates that the periods of unsatisfactory working may extend over a few hours during sunrise and sunset. When the natural conditions are particularly adverse, the service for many hours during a day may become irregular, with intervals of total cessation of communication. The only merit of the radio system so far as the Tasmanian-mainland service is concerned, is its lower capital cost compared with a submarine cable. It provides only one complete channel of communication, yet its annual cost will be slightly greater than that of a cable capable of providing at least five channels. To increase the capacity of the radio system to two channels will almost double the capital cost and very greatly increase the annual charges. The cable is inherently secret, whereas the radio system can only be made so with difficulty and added expense. The cable, moreover, provides a continuous service, apart from any fault which might

develop and which experience shows is a remote contingency, whereas the radio system is subject to intermittency of service.

The establishment of a radio telephone link will necessitate the provision of two radio sending stations, one in Victoria and one in Tasmania, and two radio receiving stations, one in Victoria and one in Tasmania. The proposed sites for these stations must take into consideration, besides suitability for the radiation and reception of radio wave, the proximity of electric power mains and water supply, trunk line pole routes, and accessibility by road. A site which would probably be suitable for the Victorian sending station was acquired some time ago and is located near Lyndhurst, approximately 29 miles south-east of Melbourne. The remaining three sites have not yet been definitely selected, but the Tasmanian one will probably be in the vicinity of Carrick (between Launceston and Deloraine) and at or near Devonport. The other Victorian site cannot yet be indicated, but will be within reasonable distance of Melbourne.

The buildings proposed for housing the equipment and plant at the respective stations will be of a simple and economical type. The estimates provide for eight residences for the staff, two residences at each radio station. When the sites are finally selected it may be that reasonable proximity to settlements will render it unnecessary for the department to provide so many staff residences. The estimated immediate capital cost is:—

Sites—Lyndhurst site (now departmental)	£800	}	3,800
Other three sites	£1,000 ea.		
Four station buildings (for plant and equipment)	4,800		
Eight residences for staff	8,000		
Equipment and plant at four stations	24,840		
Trunk terminal equipment	4,440		
Lines—between terminal equipment and stations (includes carrier equipment)	9,750		
Total			55,630

The annual charges for the proposed radio telephone link are estimated to be £18,840.

The estimated traffic during the year is greater than that which could be carried by one channel. Since the radio system can provide only one channel the full revenue that would be obtainable with the cable system during the first year could not be realized with the radio system. In addition, the revenue on the radio system will be further reduced by the natural disabilities previously described. The revenue estimate has, therefore, been based on an average of 50 calls, or 75 speech periods per day. This is considered to be a reasonable estimate of the average daily capacity of the channel. The traffic from King Island, which is provided for by the cable, cannot be handled by the radio system, since its terminals will have no telephonic connexion with King Island. The potential revenue from King Island calls must, consequently be excluded from the radio scheme. In these circumstances the estimated revenue from the radio channel is £3,530 per annum on the basis of the normal radial tariff for trunk line service.

The committee will observe that the figures that I have presented differ slightly from those that were originally submitted by the Minister. The alterations are due chiefly to revised routes, and to the result of further investigation as to available facilities, particularly for the trunk line traffic. They have not, however, been so amended as to take into account the drop in the price of copper and other metals that are used in the submarine cable scheme. When telephone communication is established with Perth next month, Tasmania will be the only State in the Commonwealth that will be cut off from speech communication with the rest of Australia. Until comparatively recently, speech communication with Tasmania was not pos-

sible; but with the rapid advancements made during the past few years in regard to both radio and cables, it is now quite practicable to link up the whole of the Commonwealth. In considering speech communication it must be remembered that there is probably as much community of interest between Hobart and Sydney as between Hobart and Melbourne, and much of the traffic will be via trunk lines on the mainland. There are over 12,000 subscribers in Tasmania, each of whom is a potential user of any mainland telephone link. The tourist traffic to Tasmania also is a very important factor in considering the probable revenue. It is quite certain that the Tasmanian people have been looking eagerly to the time when their period of isolation telephonically will end; and although obviously from the point of view of the post office balance-sheet, the project is not a payable one, at any rate at first, yet its national aspect must be considered. We have spent a good deal of money in building country lines that are no more remunerative at present than the Tasmanian route promises to be; but nationally—that is, from the point of view of country development—it has been considered worth while. In the same way, although for the first seven or eight years the cable scheme would not pay its full capital and interest charges, and the radio scheme can never hope to do so, yet the Tasmanian people undoubtedly consider that, now that the linking up of the island is technically possible, they should be given the same opportunity of speaking to the mainland as is given to all other Australian subscribers. Of the two schemes that are now practicable, the committee will note that the annual charges of the cable scheme are the lower, while the revenue which may reasonably be expected is in the case of the cable scheme immediately more than double that of the radio scheme; and as the carrying capacity of the cable becomes more and more drawn upon, the revenue will rise proportionately until, after about the seventh or the eighth year, the scheme will begin to pay. The cable would, moreover, provide immediately a broadcasting channel for the relaying of mainland programmes. While broadcasting would be quite practicable with the radio scheme, it could be given only at the expense of the telephone transmission; that is to say, ordinary telephone business would not be possible while broadcasting was in progress. With regard to the reliability of the two systems: Obviously the cable is the more suitable and reliable, but I think it may be taken that for a very large proportion of the ordinary working hours the radio scheme would provide a reasonably reliable speech channel. On the score of secrecy, obviously the cable scheme is the only dependable system. While a speech inversion arrangement would probably be quite applicable during most of the time when communication was established, it could be circumvented by any one who was prepared to go to the expense and trouble of doing so, and some radio experimenters might quite conceivably be prepared to do so. It is certainly significant that in the Anglo-American system, which has been working for some time, a cable scheme is now being developed. Latest advices are to the effect that the project has sufficiently advanced that a trans-Atlantic telephone submarine cable will be proceeded with, and it is stated that it is expected to be completed by the end of 1932. That is a very significant fact; because, obviously, the expense of approximately £3,000,000, which is the estimated cost of the London to New York cable, would not be incurred if the radio link were meeting all requirements. However, so far as the post office is concerned, our only desire is to proceed with whatever scheme Parliament in its wisdom may decide upon, and just whenever the necessary money can be made available. Whatever Parliament may decide upon in the national interest, it will be our duty and pleasure to carry out to the best of our ability. If it be decided to postpone the

project until the present period of acute financial stress has passed, we will continue to watch carefully all developments on both the cable and radio sides, so as to be ready to re-present the scheme, when desired, with the least possible delay; or, alternatively, if approved, to proceed with it so soon as the financial situation should allow. The number of telegrams that now pass between the mainland and Tasmania is approximately 500,000 per annum. The press messages last year numbered 57,136. Doubtless there would be some diminution of that traffic if a telephone service were available, but just how much it is difficult to estimate. We find that additional facilities do not necessarily diminish the amount of telegraph traffic. That aspect was considered when the Perth scheme was being investigated. I think that in this case it will be proved that the additional facility will not greatly decrease the telegraph revenue. I certainly think that at the outset one radio channel of communication would be insufficient to cope with the business offering. The object of referring that system to the committee is that the capital outlay is very much less than that of the cable scheme, and it would provide facilities that are not now available. A quotation for the submarine cable was obtained, but I think it is distinctly on the high side. There are at least three, if not four, English firms, and probably one continental firm, that can undertake to supply and lay a submarine cable. A cable is regarded as having no residual value at the end of 40 years; that is the reason for allowing for depreciation at the rate of £3,970 per year. Maintenance embraces the repeater costs at either end, and such expenses as are essential for the working of the cable at King Island, and at the two terminal points. The telegraph cables to the east and the west coast of Tasmania have been laid since 1909, and there is no sign of wear in them yet. It is known that some submarine cables have been down for as long as 70 years. It is difficult to say where would be the nearest cable repair ship; it might be in Australia, or it might be not nearer than New Zealand. In comparing the schemes one has to remember that the cable will probably go fairly rapidly, and it might, and probably would, be easier to charter a steamer in Melbourne. We already have all the machinery, such as the dynamometer and the various straining tackle, to load on to a chartered steamer, which could proceed immediately to the scene of a break. With a telephone cable system a more accurate test can be made than with the telegraph cable system. The length of time taken to repair any fault that developed would depend on the availability of the ship and the weather conditions; it would probably be from three days to six days. During my period of office our cable has gone on two occasions, and we have been able to right the defect in about three and ten days. A submarine telephone cable has armouring round it. Inside there is jute. Then there is a lead sheath, and then the copper conductors. We would have only three pairs of conductors, one of which would be used for broadcasting purposes. With the three conductors we would be able to have five telephone channels, and additional telegraph channels if such were needed. Of course, the day will come when that will be necessary, because the cable that has now been down for 21 years will not last indefinitely.

14. *To Mr. Curtin.*—We can run the telegraph connexion through the telephonic cable at any time, by means of a telegraph carrier. We can put in a large number of telegraph channels at voice frequency.

15. *To Senator Reid.*—There is no reason why it should not be a permanent arrangement, because it would not interfere with the five-speech channels.

16. *To the Chairman.*—The proposed cable will cope with the possible business, certainly for 25 years; its capacity thereafter will depend upon the development of business on the island. The service will begin to

pay in about the eighth year. If our figures are conservative, as we think they are, it will begin to pay earlier; if not, it may not pay until the tenth year. I have not taken very much notice of whether there is a demand for this service in Victoria; but during my period in office I have been in Tasmania five or six times—nearly one visit per annum—and on every occasion I have been bombarded with the question, "When are we going to get the telephone?" The impression I gathered from leading business men in Hobart, Launceston and Burnie to whom I have been introduced, and who know that I am a postal official on the engineering side, is that Tasmania is exceedingly keen on this matter. I believe that the committee will have no difficulty in convincing itself that Tasmania, at any rate, wants this service. The scheme put forward is feasible, and although it will not pay for a time, there is no doubt that nationally it is desirable. The financial position, however, must be considered, and in that respect we must be guided by Parliament. Our calculations have not undergone any variation on account of financial conditions since the proposal was prepared. I know that the price of copper has since dropped considerably—from somewhere about £70 to about £47 10s. a ton, but one cannot say how long it will remain down. It is quite clear that our costs are on the conservative side. It is not for us to say whether there is justification for embarking on the project at the present time. The usual departmental arrangement in regard to the provision of quarters will be made, namely, to charge officials 10 per cent. of their salaries if they are furnished with quarters. The estimates with respect to the buildings have been supplied by the Works Department. I think it can be accepted that the most expert cable firms in the world are established in England. Frequently, big American combines let to English firms their contracts for submarine cables. I would not say that there is no possibility of having the cable manufactured in Australia; but whether it is economically justified is a matter for the cable people. It is not manufactured here at the present time, because we do not need a sufficiently large quantity. The 189 miles that we would require would be supplied in a single length. It is just as easy to produce cable in a continuous length as in a number of shorter lengths.

17. *To Senator Reid.*—Under the radio scheme we would have one two-way channel. That means that speech is possible both ways, as it is with a trunk-line. You could not have two separate conversations going on at the one time in the one direction. It is common knowledge that you cannot get a continuous radio system. The Anglo-Australian system is rather an exceptional one; from it we get about five hours a day. So far as we know, natural phenomena—such as sun spots, magnetic storms and electrical variations and disturbances of the upper atmosphere—are the accepted cause of interruptions to a radio service. We know that we have magnetic and electrical interferences which coincide with the presence of those natural phenomena. It is the accepted opinion of radio engineers that those phenomena are the cause, although we have no definite knowledge that they are.

18. *To Mr. Curtin.*—The interruption is more marked at certain periods of the year and at certain times of the day.

19. *To Senator Reid.*—Generally, the obstruction is greatest at equinoctial times, and at the hours of sunset and sunrise, but it varies with the frequency. We have not had any experience that would enable us to form an opinion as to the extent to which our ordinary phenomena would affect this service; that is a matter of conjecture at the present time. Sunrise in Australia and sunset in the Old Country largely coincide. The hours during which we get the most satisfactory results on the Anglo-Aus-

tralian service are between 5 and 8 p.m. and from about midnight to 5 a.m. Australian time. That, however, is not always the case. I merely give our experience on days when everything seems to be all right, and when there does not appear to be much atmospheric disturbance. We speak of those hours of commercial transmission as being "above merit." When the conditions are "below merit" it is not worth while offering the service to the public. I take it that the same phenomena will apply in all parts of the world. On the Anglo-American service, despite the fact that they have a long wave system, which is the most reliable system procurable, and at least three short wave systems, and that they are able to vary their frequencies and their wave lengths, a considerable amount of disturbance is still encountered. It is of interest that they carry as much traffic on the long wave as on the three short wave systems. As to whether, apart from national policy, we would recommend going ahead with this proposal under present financial conditions, I can merely say that we have furnished the full facts and stated the estimated revenue. The committee has as much to guide it as we have. We are not anxious to see our balance-sheet further loaded. Unfortunately, everybody regards the post office as a commercial concern, and if there is a loss it is charged with inefficient management. It does not necessarily follow that there is inefficient management, if in the national interest we give a service for which we do not receive a *quid pro quo* in our balance-sheet. The revenue estimates were revised quite recently, and those relating to expenditure about nine or ten months ago, just before the depression became most pronounced. Under present conditions our estimates might be slightly lower.

20. *To Mr. Gregory.*—It is desirable that the sending and receiving stations should be as far apart as possible. On present advices we would like them to be between 40 and 50 miles apart. The sites we were investigating in Tasmania were Devonport and Carrick. The latter is 9 miles radially from Launceston, and Devonport is about 40 or 50 miles away. Those considered in Victoria were Westernport, and either Lyndhurst or a site possibly just to the north of Melbourne. Actually, we will make measurements with our portable radio set to test out the best possible site. The radio service between New Zealand and Australia has not yet been opened. The New Zealand Government is going to co-operate with us in that service, which will be a Government service. We are just waiting to open it. We shall work through the radio stations of Amalgamated Wireless (Australasia) Limited, at Pennant Hills and La Perouse. We are using those stations for our Anglo-Australian service, and the projected Java service also will have its terminal point there. The New Zealand service is a telephone service. We do not know what the cost will be, as we have not installed it. We will control the service, but will use Amalgamated Wireless stations, for which we will pay them a certain amount of the revenue. The arrangement pays us all right. I do not know whether they have taken any account of the cost. They have these stations for ship to shore work. They tested them, and found that they were practical for use during certain hours of the day for a service to New Zealand, and came to an arrangement with the Government to use them. Obviously, our costs will be covered by the charges that are made. We will control the service, inasmuch as it will be handed over to us at the Sydney end, from which point we will use our own trunk line system. Actually, messages will be sent along two channels. We will combine them at our terminal in Sydney into one bi-directional channel. We had to procure special apparatus for that purpose. The system is practically ready to be opened; I have already spoken to New Zealand. I cannot say what stage the

negotiations have reached. I hope that it will be in operation before the end of the year. Under this Tasmanian proposal the cable will contain provision for five channels, but we shall need only two at the commencement. Whenever it is found necessary to have additional channels, the equipment can be put in at a cost of £200 a channel. We have made up our estimates on the basis that the cable will be abandoned in 40 years. It would not be worth while to send out and pick it up. I do not think that we should be assisted in any way by awaiting the experience of the working of the New Zealand system. Already we have had experience in many other parts. There ought to be less difficulty in carrying on conversations between Tasmania and Australia than between New Zealand and Australia, where the distance is four or five times as great.

21. *To Senator Dooley.*—Hitherto we have not made inquiries as to whether this cable can be manufactured in Australia, but we know that it has not yet been made. It is a special type of cable. I doubt whether the manufacturers here would lay down a plant to manufacture it, because we could not offer them any repeat order, and we want very little submarine cable for our rivers and channels. Recently we put a cable across to Kangaroo Island in South Australia, but that was only a flea bite. You could not expect works to incur heavy expenditure in putting down plant to supply one cable. It is not as though, under present Australian conditions, they could look for any export trade. A great deal of investigation is being carried on in regard to wireless equipment. In this connexion you are up against natural phenomena, which has been tackled by very many administrations and big companies. You will never get rid of natural phenomena; all that you can hope for is to circumvent them. In about eight years' time this submarine cable would begin to pay depreciation, interest, and working expenses. If it should have a greater life than 40 years, the annual charges would sooner be realized. This cable could not hope to carry anything like the number of messages that are now sent by telegraph; you would need probably two cables to do that. We have found that an additional service brings its own revenue. Actually, between England and America, as the revenue has risen on the telephone service so also has it risen on the telegraph service. Each year there is an additional number of subscribers both in Tasmania and on the mainland, all of whom are potential users of this link. The bigger your constituency, the greater the volume of traffic.

22. *To Mr. M. Cameron.*—There are no submarine telephone cables that have been down for any very long period, but there is no reason to suppose that their life would be less than that of the telegraph cable; it should be at least equal to, if not greater, than the life of the telegraph cable. Submarine telephone cable is protected in the same way, and, in addition, has a lead sheathing. Improvements are continually being made to cable parts, particularly to the conductor and in the method of loading. Perminver, an alloy composed of iron, nickel and cobalt, is one of the recent improvements of submarine cable in respect of its high transmission qualities. There would be no point in scrapping the existing telegraph cables so long as they last, but at the end of their useful life this cable would enable us to carry all the telegraph traffic, in addition to the traffic that we now propose to carry on it. We cannot use the present telegraph cables for telephone work, because of the high capacity of the cable. The new cable will be loaded. Loading has been discovered since the telegraph cables were laid. It is not possible to utilize an unloaded telegraph cable, such as are the east and west cables, for speech purposes over a distance of 190 miles. I shall explain the

meaning of the term, "continuous loading". In one system, a fine silicon iron wire is wound over the conductor. In another system there is an iron alloy. In a third system it is coil loaded where instead of being evenly spread over the conductors, the inductance is placed at particular points. On the trunk line cable between Melbourne and Caulfield racecourse there are heavy loading coils in iron pots every half mile, and they give a very high inductance per unit of resistance. All wire has a certain capacity. The cable underneath Bass Strait has a very high capacity indeed, and at the present time there are no means of neutralizing it. If that capacity could be neutralized the cable could be used for telephonic purposes. Loading is resorted to for the purpose of neutralizing the capacity of the cable. The phrase "continuously loaded" means that the capacity is continuously being met by inductance by means of a fine wrapping of wire alloy. I anticipate that there will be a good deal of telephonic business done between Hobart and Sydney, because of the community of interest between those two cities. There is a line of steamers running between them at the present time. Our estimate of revenue is based not only upon the Melbourne-Launceston business. During the tourist season a call from Hobart to Cairns would be of considerable value to us. We should get the whole of the revenue from Melbourne to Cairns and from Hobart to Launceston, in addition to the revenue between Launceston and Melbourne over this link. The likelihood of interruption is less over a submarine cable than over a land line. You cannot have a more stable channel of communication, because nothing goes wrong with a submarine cable from year to year. Its characteristics do not change. Once you get on to the land there is an increasing danger of interruption.

23. *To Mr. Holloway.*—The provision of this cable would not mean the replacement of a service that already exists, but would have the effect of breaking new ground. At the present time, all that the people of Tasmania and the mainland have is telegraph communication. It would not be merely a transference of revenue from the telegraph service to the new service. Very largely you break new ground when you provide a facility that has not previously been available. I can imagine members who come from Tasmania speaking to their homes frequently, whereas they would not telegraph. Undoubtedly, the establishment of this new service would have a tendency to increase the number of telephone calls. We have found that between all our centres of population, but chiefly between the capital cities, as the number of telephone subscribers grew the number of users of the trunk service also grew. Between subscribers of one exchange there is a certain community of interest. The community of interest between those subscribers and subscribers to an adjacent exchange is rather less; but as the two exchanges grow, the inter-exchange lines also grow in a very definite proportion until you come to the more distant networks. You must then have an increase in those longer junctions. There is a very definite ratio between the volume of traffic between Melbourne and Sydney, Melbourne and Adelaide, or Sydney and Brisbane, and the number of telephones in those places, but there is no equivalent relation between that traffic and the telegraph traffic carried on between those places. Seeing that there are between 13,000 and 14,000 subscribers in Tasmania, obviously you would have immediately a large constituency for your submarine telephone. Every subscriber in Tasmania, no matter where he lived, could immediately telephone to any subscriber on the mainland. The more convenience a service offers, the larger is the number of users of it. Undoubtedly, scores of people in Tasmania

who have not now the telephone in their homes would be encouraged to get it, if they wanted to have a marine service frequently. In my opinion, aside the question of the Government's fiscal duties, the people of Tasmania particularly on the mainland, are entitled to be given such a service in the same way that we give service to the people of each State. Tasmania is one of the States of the Commonwealth, and it should be permitted to communicate telephonically with the other States on the mainland. That could not be done recently. Now that it can be done, there is a strong justification nationally for it. There is a great necessity for this service. Obviously, it is desirable that a submarine cable be made in one piece. It is quite possible to make it in lengths of 3 miles, but in that case there would be joints, which are a potential source of danger. I am not sure whether the manufacturers make it in one piece, but I know that they like to have it in sections of length.

24. *To Mr. Curtin.*—That is a desirable thing to have its manufacture, because there is always a possibility of danger in jointing. A man whose hands are not a bit of good as a cable jointer. There is no one the best will in the world, but he cannot be trusted simply because his hands would tend to be unsteady.

25. *To Mr. Holloway.*—I do not suggest that we cannot put joints in a submarine cable. We can find a fault we have to remove the fault, and that means two joints. Actually there are joints in the East and West cables. There are jointers at Port Kembla, but I doubt very much whether they would be prepared to bring out specifications to manufacture submarine cable, on a scale that is a little work that we have to offer them. We would need 200 tons of copper is used. We would need 200 tons of copper per mile. In determining when we should lay the cable, we adopt the practice of taking into account the buoyancy of the metal market. I do not know if it were decided to proceed with it.

26. *To Mr. Curtin.*—The laying down of a submarine cable would enable us to carry all our telegraph traffic easily in the event of the telegraph system renewal. I do not think there is any danger of the life of the telegraph cable already laid down, of which 21 have elapsed. So far, there is no indication that it is beginning to deteriorate. The use of gutta percha, which does not vary very much with the sea. We have two cables, each of which is a single wire. We are able to cope with telegraph work on those cables. A submarine cable would not be of any assistance to the connexion with any future telegraphic submarine cable would be. As 21 years of telegraph cable's life have already expired, 21 years of telegraph use from this submarine cable. From an engineering standpoint, I consider that the department has in no way to be of the submarine cable as against the telegraph. If the department were given an absolute authority to do the best thing in an engineering sense, it would undoubtedly construct a submarine cable in preference to the wireless system.

27. *To Mr. Long.*—You could have 5-mile lengths, or half-mile lengths, but obviously you would not want to have a joint every 5 miles. The manufacturers desire that we should have every joint is a potential source of danger, the longer the length, the better. The length from Fanning Island is 3,000 miles. So it was turned out in one length. The less possibility there is of danger, the better. The amount of copper used would be approximately 200 tons of an inch. We require not more than 200

whereas the ordinary No. 8 gauge wire runs about 400 lb. to the mile. There is nothing to prevent the Port Kembla works from turning out the required copper; but if you were to turn out the copper there you would also have to complete your cable there. It would not pay to turn out copper at Port Kembla and send it to England to be dealt with. There is nothing to suggest that they cannot complete the whole of the armouring, but they have not done anything like it yet. During the last four or five years we have placed three cables across Sydney harbour. The distance there is only 750 yards from cable hut to cable hut. The actual cost of this cable would be £600 a mile.

28. *To Senator Sampson.*—The estimate of £1,000 for the site of a radio station at Carrick is not exactly a guess. We have in our mind's eye three sites round there. We estimated that, on the basis of the highest price quoted, the price for the area that we wanted would be £1,000. A radio telephone system would not give communication to King Island, and, if it were adopted, we should lose the prospective business of the 170 subscribers on the island.

(Taken at Sydney.)

SATURDAY, 15TH NOVEMBER, 1930.

Present:

Mr. LACEY, Chairman;

Senator Dooley	Mr. Curtin
Senator Reid	Mr. Gregory
Senator Sampson	Mr. Holloway
Mr. Cameron	Mr. Long.

Richard Stanley Dawson, cable engineer to Siemens (Australia) Proprietary Limited, sworn and examined.

29. *To the Chairman.*—I am aware that the Commonwealth Public Works Committee is inquiring into a proposal to connect Tasmania with the mainland by a submarine telephone cable. I have had considerable experience in the laying of such cables. Recently our firm laid, for the Postmaster General's Department, a composite telephone and telegraph cable from the mainland of South Australia to Kangaroo Island. This cable is about eight miles in length, and is known as the non-loaded type. The only real difference between the loaded and non-loaded types is that in the loaded cable there is a spiral of special alloy wire wound over the conductor. Although the Kangaroo Island cable is only eight miles in length, our firm has laid loaded cables of similar design over distances of up to 160 miles, and the service over these lines has been entirely satisfactory. As far as I know, there are, in England, only two firms capable of supplying submarine telephone cable, these being our own, Siemens Brothers and Company Limited and the Telegraph Construction and Maintenance Company. It would not be commercially practicable for a local firm to engage in the manufacture of submarine cable. The selection and manufacture of insulating material is a highly specialized business which has occupied the attention of these English firms for many years. In addition, the application of the loading, on which the success of the cable depends, is an exceedingly intricate and very slow process. I am confident that there is no firm here which could undertake the work. Moreover, it would not pay an Australian firm to install the necessary plant, because the demand for cable in Australia is so spasmodic. Even for the English factories, which receive orders from all over the world,

the overhead expenses are very heavy owing to the spasmodic nature of the demand. As I said, the loading process is a very slow one, and one machine can load only half a mile of core a week. It will be readily seen, therefore, that if there are four cores in a cable 200 miles long, a very considerable amount of plant is required to do the job within a reasonable time. Submarine cable is supplied in lengths to meet the requirements of the customer. For the proposed service, it could be made in two lengths of 80 miles. In ordinary circumstances, it is not satisfactory to supply the cable in very short lengths, as this requires a lot of jointing on the job, and unless such joints are very carefully made they may possibly lead to trouble. At any rate, it is only natural that a better job can be made of joints under perfect conditions in the factory than on a ship bobbing about on the sea. For that reason it is usual to make cables in continuous lengths. It is difficult to say what would be the life of a submarine telephone cable under normal circumstances. They have not yet had a chance to prove just what their effective life is. The Anglo-French cable laid in 1910 is, to the best of my knowledge, still in perfect order. I know of telegraph cables which are not radically different in construction from telephone cables, that have been in use for 50 years. Some of the early Atlantic cables have been in use for over 50 years. There is one between Kangaroo Island and the mainland of South Australia which has also been laid for more than 50 years. I had an opportunity of examining it not long ago, and it is still in perfect electrical condition. So far as I could see, there was no reason why that cable should not last for another ten or fifteen years. That makes an effective life of 65 years, and with the more efficient methods of construction now employed, there is no reason why the life of a cable should not be even longer. What usually injures cables is not age, but mechanical damage of some kind, such as might be done by a trawler, a ship's anchor, or by the cable chafing against a ledge of rock. The cost of maintaining a cable is not great. The only plant needed is some suitable picking-up gear, which has to be gone over every now and then to keep it in order. It is also necessary to have available a suitable ship to go out and make repairs. The ship need not be always in commission for that purpose, but should be available when required. The Postmaster General's Department already has gear for the maintenance of the existing Bass Strait telegraph cable, and they get the use of the SS. *Iris* from the Pacific Cable Board when necessary. For three-pair submarine telephone cable, the cost would probably be in the vicinity of £500 a mile. It would cost another £150 a mile to transport and lay it, making the total cost per mile about £650. I would not say that the modern tendency is to discard submarine telephone cables in favour of wireless telephone services; in fact, I think the contrary is the case. For instance, there is at the present in train a project for laying a telephone cable across the Atlantic over which a wireless telephone service already exists. This projected cable would be 2,000 miles long, and would be laid between Ireland and Newfoundland. It will supplement the existing wireless service. The telephone cable has this advantage over the wireless telephone: It provides a 24-hours-a-day service, absolute secrecy and freedom from interruption.

30. *To Senator Reid.*—The patent for the process of loading submarine telephone cable is the property of the Western Electric Company. A very close co-operation exists between the firms engaged in the manufacture of submarine cable, and a company holding certain patents does not always exercise its patent rights. Quite often it is willing to allow another firm the free use of the process in exchange for such ideas and experience as that firm may be able to give it in return. Of course, if some other outside organization proposed

to manufacture cable it is only reasonable to suppose that it would have to pay the present holders for the right to use their patents. Submarine cable is not being manufactured to any great extent in America. Most of the cable used by that country is bought from British firms, and the cable for the proposed new telephone service will be obtained from Britain. The process of loading, which has made the submarine telephone cable possible, is an extremely delicate undertaking, requiring the use of costly and elaborate plant. It is done by winding a special alloy wire around the conductor, and in contact with it. The alloy requires special treatment; if it is bent or heated its properties are not the same as before, so that these operations must be carried out under proper conditions, and in an atmosphere of nitrogen. The care and technique required in this and other aspects of cable manufacture have kept most firms from taking it up. Loading for cables was first thought of by Oliver Heaviside, in 1887. He predicted mathematically that such a thing was necessary, and later Michael Pupin introduced a species of loading, though it was somewhat different from that just described. It was an American, I think, who discovered the special alloy used in the present method—one of the experimenters attached to the Western Electric Company.

31. *To Mr. Curtin.*—Even allowing for the difference in the capital cost, and the interest payments thereon, I still think that the advantage lies with a submarine cable service for telephonic purposes as against a wireless service. I have never known a wireless telephone service to be infallible over 24 hours in the day, whereas the cable is always reliable, and never suffers any interruptions. As far as the quality of the speech is concerned, I do not think that there is anything to choose between them. It is true that the cable costs more to lay, but it is cheaper to maintain. For the wireless station, receiving and transmitting stations have to be erected at each end, and these have to be maintained and staffs paid, and this would go a long way towards offsetting the advantages of a smaller annual interest bill. I speak, of course, without personal knowledge, having had no experience in regard to wireless telephone services.

The sample of cable produced is from that used for the service between Kangaroo Island and Tasmania. It has four main cores, and four smaller earth cores. They are made of copper, and copper of Australian origin has been used by our firm in the manufacture for a good many years. Exactly what proportion of Australian copper is used is a matter outside our control; it depends on the supplies on the market. The insulating material employed is either gutta-percha or what is known as "balata." That, I should say, certainly could not be made in Australia. On the loading, and on the electrical properties of the material used, the whole success of the cable depends, so it can be seen how careful we must be in all phases of manufacture. The spaces between the cores are filled in with tanned jute to make the cable circular. Over that is placed a textile tape treated with a water-proof composition, and around that again is wound a brass tap to prevent the teredo—a marine worm—from boring into the cable. These creatures cannot bore through brass though they will bore through lead readily enough. Outside the brass covering is put more compounded tape, and more jute as bedding for the armour, which consists of galvanized steel wire of .276 gauge. A final covering or serving is put over the steel armour to facilitate handling and to retard corrosion. It does not matter if this outer covering disappears after the cable is laid, though I have seen cable which has been in use for 30 years, and the covering was still in fairly good order. Its life depends on the nature of the bottom. Submarine telephone cables are still being laid despite the advent of the wireless

telephone. One was laid for the Norwegian Government in 1919, length 80 miles, and another in 1920, length 161 miles. The Anglo-Irish telephone cable was laid in 1922 over a distance of 22 miles. A similar cable between the North and South Islands of New Zealand was laid in 1925, length 45 miles. Another cable, 45 miles in length, was laid for the Japanese Government in 1925, and in 1926 a cable 27 miles long was laid across the straits from British Columbia. In 1927 still another service was installed, over a distance of 27 miles, for the Norwegian Government, and a 71 miles cable was laid down for the Japanese Government in the same year. During 1927-28 two cables were laid for Nova Scotia, one of them one mile in length, and the other seven miles. In the ordinary telegraph cable the core is simply a copper strand surrounded by an insulating material over which is laid the armour. Owing to the electrical properties of the cable it is impossible to use it for telephony over more than short distances, because the voice becomes so distorted. It was found that by winding a special alloy around the conductor its inductance could be increased, thus preventing distortion. By continuous loading is meant winding the alloy around the conductor from one end to the other in a close spiral. Another method of achieving the same object is to insert inductance coils at specified points. They are made up in the cable itself, and such a cable is said to be coil-loaded. It is possible to get a greater amount of inductance with coil loading than with continuous loading, but as against this the coil loading makes a bulge in the cable which, from a mechanical point of view, is a disadvantage. The coil loading system is cheaper than continuous loading, but over a length of cable such as that under consideration, the difference in cost would not be substantial, except in the case of a large number of conductors. Although telegraph cables cannot be used for telephone purposes, there is nothing to prevent a telephone cable being used for telegraphy, even without its having been specially designed for that purpose. If, however, it is intended to use such a cable extensively or continuously for telegraphy, it would be well to specify that when it is being made. The difference in construction necessary to conform to such specification would not add materially to the cost.

32. *To Mr. Long.*—It would not be commercially possible to make submarine cable in Australia, as the demand would not be large enough. The original Bass Strait cable was laid by our firm in 1909, and since that date I can remember only two other submarine cables that have been supplied by us for Australia. No Australian factory could hope to carry on with only two orders in twenty years.

33. *To Mr. Holloway.*—A cable laid in 1909 should, under normal conditions, be still in use after 50 years. It is almost impossible to forecast the life of a cable. Balata, or gutta-percha, the insulating material used, has the property of actually improving with age so long as it is kept under water. Electrically, a cable which has been under the water for many years is better than one just laid. The life of a cable is usually terminated by accident, or by mechanical damage resulting from lying on an unyielding bottom. I should say that there are not more than half-a-dozen firms engaged in the manufacture of ordinary submarine cable, and only half of these are equipped to make loaded cable.

34. *To Mr. Conyon.*—The cable to Tasmania would be, for the greater part of the way, lighter than the sample we have been examining. The weight added by continuous loading is negligible—not more than five or six per cent. I was personally concerned in the laying of the Kangaroo Island cable. The trouble was that the cable was too short, so that there was not sufficient slack. We did not supply the terminal

equipment, some of which, I believe, was unsatisfactory, or was not ready on time. Later, when the cable was lengthened by putting a piece in, the results were all that could be desired.

35. *To Mr. Gregory.*—The only difference in construction for deep-sea cable, and that for use in shallow water, is that the armour is lighter for deep sea purposes. Deep-sea cable is in less danger of damage from trawlers or ships' anchors, and there would be less movement of the water itself. In great depths there is no movement whatever. The shore ends of a cable are much more heavily armoured than the deep water parts. On very rocky coasts the cable is sometimes doubly armoured. On the route of this projected cable no difficulty is anticipated, as the bottom is reasonably good. A cable considerably lighter than the one used in the Kangaroo Island service would do. If the department has in mind a three-pair cable it should not be more costly than the estimate I have given. When a new cable is laid, the usual arrangement is that the manufacturer shall stand behind it for a month to see that it is satisfactory. If a guarantee is required against faulty material or workmanship a special arrangement would have to be made. Of course, there is a general guarantee given that the cable will do the work specified. All cable is very carefully tested. It is tested during manufacture, when it is being put on the ship, and again while it is being laid. If there is any defect it is detected straight away. There are no technical difficulties associated with the repair of a damaged cable. The cable is simply picked up with suitable gear, a piece is inserted, and the ends spliced together. The teredo is the only marine animal which will attack cable, and the brass tape is sufficient protection against it.

36. *To Senator Dooley.*—If a three-pair, or six conductor cable were recommended for this service, it would be similar to the sample which is before the committee. I have never been through the Port Kembla works. They make telephone cables there, I know, but those are lead covered, and are made with dry paper insulation. There is no armouring machine at Port Kembla, nor is there a loading machine. I am convinced that they could not make submarine cable.

37. *To Mr. Cameron.*—Before any cable is laid, an accurate survey is made of the route. Soundings are taken at frequent intervals, and from these soundings, the depth of water and nature of the bottom are arrived at. If rocky or steep patches are encountered, care is taken to avoid them. I have only seen the Admiralty chart of the route for this proposed cable, but from that I should say that the route is quite good. The cable of which the committee has a sample before it weighs about nine or ten tons to the mile. If it were less heavily armoured it would weigh less.

38. *To Mr. Holloway.*—I have heard of a ship's compass being affected by what was supposed to be the influence of iron deposits in the neighbourhood of Bass Strait, but I do not think that a cable telephone service is likely to suffer any interference from this cause.

(Taken at Sydney.)

MONDAY, 17TH NOVEMBER, 1930.

Mr. LACEY, Chairman;

Present:

Senator Dooley	Mr. Curtin
Senator Reid	Mr. Gregory
Senator Sampson	Mr. Holloway
Mr. Cameron	Mr. Long.

Ernest Thomas Fisk, Managing Director, Amalgamated Wireless (Australasia) Limited, sworn and examined.

39. *To the Chairman.*—I am aware that the Public Works Committee is inquiring into a proposal to connect Tasmania with the mainland by means of a telephone service. In my opinion, radio telephony has reached a stage when it can be considered suitable for such a service. I know of only one recent instance in which a radio telephone service has been installed over a distance similar to the one under consideration. That service is from Rome to Sardinia. When I heard that the system had been installed, I inquired for particulars as to whether it was providing a 24-hour-a-day service. I received the following reply:—

Rome-Sardinia service opened officially 14th August, 1930. 24 hours continuous service is not yet obtainable every day, seasonal and other atmospheric conditions causing reduction, but improvement in aerial and apparatus continue, and changes already made give every confidence of ultimate 24 hours service under all except very abnormal circumstances. The complete network of Italy and Sardinia are connected through this wireless circuit, which is sole means employed for telephone communication, and conversation has been carried on from London via beam with Sardinia.

There are in operation, of course, other radio telephone services, but they are all over greater distances than that which separates Tasmania from the mainland. There is, for instance, the service between Australia and London, the Trans-Atlantic telephone service, and the New Zealand-Australia service which we hope to open to the public next week. One of the difficulties associated with establishing communication over short distances arises from what is called the "skip distances" of the waves employed. The skip distance varies according to the length of the wave. The term is used to describe the phenomenon which results in a station being audible for a certain distance, being practically inaudible over a further distance, and then coming in again quite strongly still further away. I do not think that this will be a serious difficulty in the present case. It will merely require the carrying out of tests to determine what is a suitable wave length. I am inclined to think that without very much trouble we should get a fairly good 24-hour service between the mainland and Tasmania; that is, between Melbourne and Hobart, or Sydney and Hobart, or between all those places. There might, perhaps, be an hour, or may be a little longer, probably during the middle of the day, when communication would be difficult. For the rest of the time, I do not anticipate any difficulty, provided we select the right wave length. On certain days abnormal atmospheric conditions might interfere with the service, but the effect would not be very serious over such a short distance. If I were asked to make a comparison between cable and radio for telephony purposes, I should say that for the next two years, or perhaps a little longer, the advantage will undoubtedly lie with the cable, in that it gives a more reliable service throughout the year. I am confident, however, that improvements of such a nature will be made in radio telephony that it will, before long, be able to compete on equal terms, so far as efficiency and reliability are concerned, with cable services. Then, it must be remembered, that a radio service is very much cheaper to install, and is more elastic in that you can alter your apparatus from time to time to keep it in line with modern developments. I am not certain what the cost of a cable would be, but I assume that if one of the new, continuously loaded cables were used the capital outlay would be at least £150,000. For wireless stations it is possible, of course, to spend varying sums, but a pair of stations to provide the sort of service about which I have been speaking could be installed at a cost of £10,000 each. Added to that would be the cost of buildings, but there would be very little additional expense except the

connecting lines between the stations and the central telephone exchange. It would be possible to install stations of the kind used in the Rome-Sardinia service for about £28,000 each. The plant could be built in Australia. These stations are a very special beam system from which, it is claimed, a much higher degree of secrecy is obtained than is possible with the ordinary radio service. For the sum of £28,000, the sending and receiving stations at each end could be provided, making a total of £56,000 for installing equipment for the complete service. However, I should not advise going in for such a system at the present time. I would put in one of the ordinary wireless services as we know them here to-day. While I am a keen advocate for the beam system, I would not recommend the installation of such apparatus for this service, but would rather install stations of the existing type, which are cheaper and less experimental. Moreover, they are capable of modification later on. I would recommend the installation of short wave wireless transmitting and receiving stations costing £10,000 for each end. Amalgamated Wireless Limited has already in Victoria sending and receiving stations employed in various services, and we would be prepared to install the necessary plant for a Tasmania service and operate it without the Government being involved in any capital outlay whatsoever. The Government would pay us merely for the use of our channel. We should be able to install such a service fairly quickly, and have it in operation about Easter time. Our transmitting station at Melbourne is situated at Braybrook. There we have a short-wave transmitter, which could be used immediately for a Tasmanian service. We have another which could be taken out and transferred to Hobart or any other suitable point in Tasmania. Thus the service could be inaugurated as soon as we got the Tasmanian end working. We have already in Victoria a large receiving centre at Rockbank handling the overseas beam traffic. We have there receivers which could be used for the Tasmanian service, and a spare receiver which could be transferred to Tasmania. We could therefore open a wireless telephone service to Tasmania very quickly, with no great capital outlay to ourselves, and no capital outlay at all to the department. The stations in Victoria are being used for various purposes at the present time, mostly telegraphic. At Braybrook, we have one service used for transmission to ships at sea; another is used for 3LO broadcasting, and there are also two short-wave stations, one of which is used occasionally for overseas broadcasting. There should not be any difficulty in linking up with the land systems at each end for this service. By varying the wave length, it might be possible to provide an effective service over practically the whole 24 hours. The last time I was in London they were experimenting with a service between England and the Argentine. They were getting a very good service except during the hours between 11 a.m. and 1 p.m. For the ordinary service they were using a wave length of about 30 metres, and on that they were experiencing difficulty during the midday period. They then came down to a length of 15 metres, and got an excellent service. We have done a great deal of that sort of experimenting between here and New Guinea, and have collected much useful information regarding 24-hour communication in a north-south direction from Australia that would be useful in this connexion. The plant which I recommend, and which would cost £10,000 to install at each end, should be able to cope with an initial traffic of 100 calls a day. For the New Zealand service the department is supplying the land line equipment, and we supply the wireless transmitter and receivers. The two systems are then joined together, and the department and ourselves share the revenue. When the department first became interested in a Tasmanian radio telephone ser-

vice, it called for tenders, and we submitted one. We quoted on the basis of our furnishing the equipment and supplying the service, and the department paying us so much a year for it. Our quotation for a 6-hour-a-day service was £8,065 a year; for a 12-hour service, £8,156; for an 18-hour service, £10,257, and for a 24-hour service, £12,238. If they contracted for less than a 24-hour-a-day service, and wished to extend the service temporarily for a day, the extra charge was to be 30s. an hour. If it is desired to double the number of calls per day, the extra cost will depend upon the number of hours during which the calls are to be made. If you merely extend the time, and spread the calls over a longer period, the extra cost need not be great. If, however, you wish to crowd double the number of calls into the same time, when the plant has already been working to capacity, it is then necessary to add another channel of communication. That means putting in almost another complete internal unit for transmitting and receiving. This would practically double the original cost for actual wireless apparatus, but if the stations had been properly designed in the first place, there would be no need to duplicate building, masts, or power units. When the buildings are being designed in the first place, provision should be made for future expansion of plant. It would not be necessary to provide two transmitting sites and two receiving sites at each end. Only one transmitting site and one receiving site at each are required. At Pennant Hills, we have ten transmitters, each capable of doing a different service, and all of them are in the same building, and can be operated at the same time. At La Perouse, we have fifteen receiving sets, all capable of operation at the same time, all housed in the same building, and using the same masts. The evidence given to the committee by Mr. H. P. Brown merely means that it is necessary to separate the transmitting from the receiving stations. In Sydney, our receiving and transmitting stations are separated by a distance of about 20 miles. Of course, there actually are four stations to each service, but it only means that the receiving and sending stations at each end are separated. At the present time, wireless telephony cannot be regarded as secret, but I believe that it is only a matter of time until secrecy is achieved. The Post Office has an apparatus which is sometimes used on the London service, the purpose of which is to confuse the speech and make it extremely difficult, if not impossible, for any one other than those supplied with the same apparatus, to understand it. Similar apparatus could be used on the Tasmanian service. From what I have been able to learn, however, they do not regard such apparatus as having achieved complete secrecy on the Trans-Atlantic service, but it has the effect of making eavesdropping very difficult. I do not know what this speech confusing apparatus costs. It is made, I think, by only one company in the world, and I have no idea what they charge for it. It might be anything up to £10,000. The cost would be determined largely by the amount of money spent in research. The apparatus itself would probably not cost anything like that sum to make. Such apparatus will be called for in the overseas wireless telephone services being operated between Australia and New Zealand, and Australia and London, and the terminal equipment employed in the post offices in Sydney and Melbourne can be used not only for overseas services, but also for the Tasmanian service, and half a dozen others as well. For the New Zealand service, the plant has already been erected, and we are all ready at this end to open, and have been for some time. There has been some difficulty on the other side with the apparatus used to connect the terminal station with the wireless service. We hope that the service will be officially opened tomorrow week. The cost of this service was approximately £8,000 for the plant we supplied, less the

receivers. That plant should be capable of handling ten calls an hour. We are a little doubtful about the midday period, but for the rest of the day we do not anticipate any difficulty in maintaining a service, providing atmospheric conditions are normal.

40. *To Mr. Holloway.*—It is true that ships send and receive messages, and that the sending and receiving apparatus cannot, perforce, be separated, but, except with some of the most modern equipment, ships do not send and receive simultaneously. The operator sends a message, then throws a switch, and turns over to the receiving apparatus. Very recently, however, on one or two of the Atlantic ships they have installed services in which that is not necessary. They use only limited power, but they do obtain results with sending and receiving apparatus operating simultaneously. It is done, however, from force of circumstances rather than from choice, and the sending and receiving units of the land stations with which they communicate are still separated. If the Government accepted the tender which we submitted, it would be involved in no capital cost except for the connecting lines between its post offices and our stations, and for the linking apparatus in the telephone exchanges. We would provide masts, plant, transmitters and receivers, and the department, by connecting these stations up with their telephone service, would be able to use it just as they chose. For that we would expect to get a portion of the toll, and it might be necessary for us to have a minimum guarantee. There might also be a guarantee as to the length of the service. For the Tasmanian service the department called for tenders according to a certain specification. We did not tender to that specification, but tendered to supply the department with stations for its own use, and alternatively tendered to provide a service for the department through our own stations. At the same time we tendered for the new type of beam service, but that would have been much more costly. If, after the service was installed, it was found that the capacity had to be doubled, I take it that the company would have to bear the cost, but, probably, that would be the subject of a contract between the department and ourselves, so that both parties would have a fair deal. The services operated from Pennant Hills have been increased from one to twelve, but additions have been made only to the actual wireless equipment and one new building. The other buildings, masts, &c., are still the same as before. I do not know what the capacity of a cable telephone service would be, but even that must reach its limit, and it would be a very expensive thing to have to duplicate the cable. With wireless you can double the capacity by merely doubling the actual wireless equipment, using the same building, masts, aerial and power plant. The trend to-day seems to be to increase capacity by putting in new channels. I believe that, eventually, wireless will overtake the cable services, and prove increasingly economical as the volume of business grows. Wireless is so much more flexible. The cable, after all, is merely a tunnel for communication, and, as such, has definite limitations.

41. *To Senator Simpson.*—I should say that about ten calls an hour is the maximum that could be handled comfortably. That allows six minutes for each call. If you allow three minutes for conversation and then make allowance for the time spent in finding the speakers, it is not likely that more than ten calls an hour could be managed.

42. *To Mr. Cameron.*—We could guarantee a satisfactory service for a specified number of hours each day, subject always, of course, to possible interference from atmospheric conditions. Static, or electrical discharges in the atmosphere, is one cause of interruption, and fading is another. Certain conditions arising from

the position of the sun and moon cause waves to become lost. Even without any abnormal atmospheric conditions reception is frequently bad about mid-day. If unfavorable atmospheric conditions are also present at that time a service would become practically impossible. Such a thing does happen sometimes, although not frequently. Adverse atmospheric conditions may prevail over a couple of days, during which time it would be possible to get communication for only limited periods, perhaps between 6 and 9 o'clock in the morning. I am doubtful whether there would ever be a day throughout the whole 365 when it would not be possible to get some communication. There might be times when it would be possible to get only half a conversation, and lose the rest, but those times are generally known, and we would not put people through, but advise them to wait. I should say that under normal conditions communication would be as good by wireless between Brisbane and Hobart as it would be over a land line from Brisbane to Melbourne, and cable from there to Tasmania. Of course, when atmospheric conditions are bad the cable is admittedly more reliable. At the outset we would communicate from Melbourne to Brisbane by land line, but later, when a station was installed at Brisbane, the link could be made a purely wireless one. At present we could give a service from Sydney to Hobart, and from Melbourne to Hobart, by wireless alone, without using any land line except the connecting link. It is possible that Tasmania would be within the skip distance area for certain wave lengths, but, no doubt, wave lengths could be chosen which would overcome the trouble. I do not think that programmes broadcast from Tasmania are received very well on the mainland, but that need not have any bearing on the efficiency or otherwise of a telephone service.

43. *To Mr. Long.*—I believe that for absolute reliability throughout the year the cable is superior to a radio telephone service, but it is easier to install a wireless service, and such service is capable of indefinite expansion and improvement. I do not believe that a wireless service ought to cost £56,000 to install, or that it ought to take £19,000 a year to maintain it. At least 80 per cent. of the plant necessary for a wireless service to Tasmania could be manufactured in Australia.

44. *To Mr. Gregory.*—The difference in reliability as between radio and the cable would not, I think, be very marked over a period. If static were bad, and communication interrupted, it would not have the effect of making people resort to the telegraph. The situation would be much as it was with the trunk telephone lines between Sydney and Melbourne five years ago, before they were so greatly improved. Usually, when we put in a call, we heard nothing more about it until we were advised that the connexion was made. If, however, we did inquire, we were told that it might be three or four hours before we could get through. With a wireless telephone service, when a subscriber put in a call, he would be advised immediately if conditions were bad, and would be told that he would be communicated with later when they improved. The figure which we quoted in our tender to the department for the Tasmanian service was a straight-out charge for providing the service, but we would be prepared to consider an arrangement whereby we would take a percentage of the fees with a minimum guarantee. If I were contemplating establishing telephone communication with Tasmania, I should, as a business man, and if the responsibility were entirely my own, employ wireless. Not only that, but I should have had the service in operation last year rather than wait to see the result of experiments being carried on in other places. I should expect to be able to adapt my station to include improvements as they become known. Amalgamated Wireless would be

prepared to open a service to Tasmania immediately, the receipts of the service to be divided between the Government and ourselves upon an agreed basis.

45. *To Senator Dooley.*—I believe we could have the service in operation before Easter if we began work immediately. The £6,000 which we quoted as a price for providing a six hour a day service would be complete for the wireless part of the service, including buildings, &c.

46. *To Senator Reid.*—If we could make an arrangement with the Government for a fifteen or twenty-year contract, I should, from a business point of view, prefer to have a small guarantee, and a share of the revenue. If the contract were for only a short number of years I should prefer a straight-out subsidy. I think that it would be better for the department to concentrate on handling the traffic, and let us concentrate on providing the service; that is, for the department merely to work through the channels provided by us. If the department erected its own stations it would be merely duplicating the services already in existence, and would have to build up a trained personnel such as we already have. The more services of this kind we control within Australia the stronger our firm becomes, and the better are we able to contract for building overseas stations such as those in New Zealand. Our getting the New Zealand contract was a direct result of the success we had made of the London service. I should say that there would be a greater number of hours disturbance through atmospheric conditions on a long link between Brisbane and Hobart, than over a shorter distance, say between Melbourne and Hobart. Apart from that, however, wireless conversations between Brisbane and Hobart should be clearer than conversations between Brisbane and Melbourne over the land line. From the point of view of capital cost, upkeep and longevity, I should prefer wireless to a cable. The life of a cable is, I believe, fixed at something like 50 years. The plant in a wireless station might not last 50 years, but it is being constantly renewed and brought up to date, so that there never comes a time when the station may be said to be worn out. The buildings and masts should last at least 50 years, or even more. It is difficult to make an accurate comparison between cable and radio, because the things are unlike. I am convinced, however, that if wireless keeps on improving at the same rate as has been maintained in the past, the advantage must ultimately lie with wireless. Apart from atmospheric interference, there is hardly any danger of a breakdown in a wireless telephone service. I cannot recall anything in the nature of a breakdown since 1922, apart from a short interruption in the overseas beam service due to a fire in the station. Regarding the midday interruption of which I have spoken, there is, we have discovered, some difference as between messages going north and south, and those going east and west, but as yet very little is known about the matter. With some wave lengths the advantage seems to be one way, while with others an opposite result is obtained. We now know most of the causes of interference, at least, in so far as we come in contact with them. We can tell which direction static is coming from, and we know how communications are affected at various hours of the day and night. This phenomenon is associated with the position of the sun, which affects the height of a reflecting layer above the earth. We do not yet know all the causes of fading, but we do know a good deal, and much has been done to overcome it. It may be claimed that we know where to attack all the major problems with which we are confronted. Midday interference is determined by the conditions prevailing over the whole path between the two points of communication.

Between here and London our communication is always best when we have the greatest portion of the track in darkness between the two places. During our afternoon the greatest path of darkness is along the north-western route. In the early morning we get the greatest path of darkness in the opposite direction, and then we send the beam messages to the south-east. The change of direction from north-west to south-east can be accomplished merely by throwing a switch. We would not use such a method in the Tasmanian service because the alternative route would lie right round the world. We might partly overcome the difficulty, however, by using different wave lengths. There would be difficulties associated even with this course. It occupies about an hour to make a change in wave length during transmission, and then it would take another hour to change back. The period during which interruption is anticipated is between 11.30 a.m. and 2 p.m., so that if we changed the wave length during that period most of the time of poor reception would be taken up in changing over and changing back again. We, therefore, think it best to leave the service as it is during that period.

47. *To the Chairman.*—We expect development in wireless to be continuous over the next few years. I see no prospect of any revolutionary changes, but knowledge is increasing rapidly, and I am convinced that in two years' time great improvements will have been effected. After five years, still further improvements will have been made.

48. *To Mr. Cameron.*—It should not cost £56,000 to install a wireless telephone service between the mainland and Tasmania, nor should it cost £18,800 a year to maintain such a service. Our company offered to provide a service for much less than that.

49. *To Mr. Holloway.*—From the point of view of continuity of service, it must be admitted that the advantage lies with a cable as compared with wireless. The cable is more reliable than wireless, and is secret, which wireless is not. As regards the cost per message to the user, that is a matter to be determined by the department. Working on a basis of 300 days a year, the cost of a wireless telephone service for six hours a day would be somewhat higher than the figure I am about to quote. However, for a service of twelve hours a day, and up to 24 hours, the figures vary from £3 15s. downwards, making an average of £2 an hour. If it were possible to handle consistently ten calls an hour, that would work out at 4s. a call. It is necessary, however, to allow for lost time, but that applies to any service. Taking it on those figures, I should say that the cost per call would be much cheaper by wireless than by cable, which has an original capital cost of £150,000. Authorities allow depreciation at the rate of 2.2 per cent. per annum on cable, which would work out in this case at £3,000 a year. Interest at 6 per cent. on the capital cost would be £9,000 a year, making an annual outlay of £12,000 before anything is spent on operating costs. Then, I understand that the proposal in connexion with a submarine cable telephone service to Tasmania is to take it to King Island, and then on again, which means the provision of repeater stations there. That would involve more expense for staffing. The figure of 4s. a call for a wireless service would cover only the cost of making the wireless link. Added to that would be the cost of the land line connexion. I should say that it would be possible to open a service to Tasmania by wireless telephone for about the same charge to the public as is made on the trunk telephone line between Sydney and Melbourne. It might possibly be a little dearer. So far as I can make out, a wireless service should be cheaper to the customer than a cable service.

(Taken at Sydney.)

TUESDAY, 18TH NOVEMBER, 1930.

Present:

Senator DOOLEY, Chairman;

Senator Reid | Senator Sampson.

Sylvester Hintercker Donnelly, Manager, Tasmanian Government Tourist Bureau, Sydney, sworn and examined.

50. *To Senator Dooley.*—During the last fifteen years I have been manager of the Tasmanian Government Tourist Bureau in Sydney, and have had thousands of tourists through my hands. I submit that I know something of their methods and peculiarities. Despite the fact that this is considered an age of independence and "do as I like," it is astonishing how the average tourist likes his and her world to know of their movements and doings. I venture to say that eight out of every ten put in a lot of their spare time in writing and wiring to their friends describing their going on from time to time. It would be interesting to know the numbers of telegrams and letters that are sent home after each arrival of the *Nairana*, *Loongana* and *Zealandia*, saying, "arrived safely after roughest trip on record; even officers ill". During the summer months our letter boxes are often full of letters, &c., chasing the tourist round. I could cite scores of cases of people travelling on our specially-conducted tours who arrange for a copy of the itinerary to be left with their friends, so that their movements may be followed. Some of the tourists seem to delight in forwarding telegrams from practically unknown hamlets in Tasmania to their relatives on the mainland, just to cause surprise at home; and it is a daily occurrence for these wires to be brought to my office to have the sending office identified. Knowing how the average tourist likes to keep his movements known, I am convinced that if telephone communication were opened between Tasmania and the mainland, during the summer months at any rate, when the 30,000 or 40,000 mainland tourists are in Tasmania, this service would be very largely availed of, and am certain it would be a very difficult matter, at times, to get connexion owing to the rush of visitors to have conversation with their friends on the mainland. In saying this, of course, I am aware that in using the telephone some revenue would of necessity be lost in other directions, such as telegraphic and postal. Apart from the tourist traffic, I am of the opinion that the telephone would be of considerable help and use to the produce world. For instance, a very large volume of business is done in potatoes and fruit between Sydney and Tasmania, and as this traffic is perishable it requires no stress on my part to convey to the committee what it would mean to the shipper at the one end, and the buyer or agent at the other, to be able to get in hourly—if need be—communication with one another; and I venture to say that when this is possible there will not be nearly the waste and loss in these commodities that there is to-day. Speaking personally, the boon to me as manager of the Tasmanian Tourist Bureau to be able to get in touch with our Hobart, Launceston and Burnie offices when arranging tours, fixing up transport, arranging accommodation &c., would be untold, as at present I often have to wait hours for replies to my wires to know if what is wanted can be arranged. Speaking as a tourist officer for fifteen years on the mainland, I am convinced that the more facilities are given the tourist or resident the more they will be availed of; and without knowing anything of whether they would or would not be likely to pay right away, I am convinced that they would be a great boon and would be largely availed of by the public generally. It is estimated that between 17,000 and 18,000 persons travelled from Melbourne to Tasmania last

year. Our own bookings from Sydney numbered 8,000, and besides these a great many travelled on overseas boats. I am convinced that at present Tasmania suffers from a sense of separation and isolation from the rest of Australia, due largely to the absence of telephone communication. A telephone service would need to be available at any hour of the day or night if it was to be used as I should like it to be. I believe that a telephone service would be of great advantage to King Island if it were included in the service. Fifty calls a day would, I think, be a conservative estimate of the business done, at least during the tourist season.

51. *To Senator Reid.*—Our office handles between 7,000 and 8,000 tourists a year, and they are from New South Wales only. The Queensland traffic is handled by an office in Brisbane. Some of the tourists we send over are well-to-do, but I should say the majority of them could not be described by that term. Very many of them are school teachers who visit Tasmania during their vacation. Even this class, I believe, would be willing to employ a telephone service to communicate with their friends on the mainland. Many business people also visit Tasmania during the season; but as a general rule they do not desire to keep in close touch with their offices. The majority of them, as a matter of fact, desire to get as far away from business as possible. Still, if a telephone service were available, I have no doubt it would prove useful to business men in case of emergency. During what is called the potato season in Tasmania, the telegraphic service between Sydney and the north-west coast of Tasmania is very fully availed of. Most of the Sydney merchants have agents in Tasmania, and it is necessary for them to keep in close touch with their city offices. For this purpose a telephone service would be very useful. The potato season is in the winter when the tourist season is slack, so that the telephone business would tend to be distributed more or less evenly over the year. Then the fruit season begins in the autumn, and that would be responsible for some traffic at any rate.

The witness withdrew.

Frank Lincoln Edwards, Secretary of the Chamber of Manufactures, New South Wales, sworn and examined.

52. *To Senator Dooley.*—A disquieting rumour which reached Sydney on Friday last, that evidence had been given before this committee to the effect that none of the apparatus for a proposed wireless telephone service between Victoria and Tasmania could be made in Australia, or at least very little of it, caused my association considerable concern, with the result that I have been instructed to advise the committee to the contrary. The whole of the wireless apparatus for this service can be manufactured in Australia, with the exception of the valves. Since reading the published evidence of Mr. E. T. Fisk, Managing Director of Amalgamated Wirelens, which organization is a member of my association, I wish to state that my association concurs with his remarks. I would also like to point out to the committee that the whole of the wireless apparatus in use at the Australian end of the Australia-London wireless telephone service was designed and manufactured in Australia. Furthermore, the whole of the wireless apparatus to be used in the Australia-New Zealand wireless telephone service shortly to be opened was made in Australia, for both the Australian and New Zealand ends. There seems no good reason why the apparatus for the Tasmanian service should not be made in Australia, but there is every reason that it should, in order to support an important national industry that has been so thoroughly well established in this country. My respectful suggestion to this committee is that the system of communication be used for the proposed

service which can be made in Australia, which will find employment for Australians and will keep the whole of the money involved in Australia. It is very necessary at this time that as far as possible opportunities should be provided for capable young Australians with technical training. In times of depression it is not the incompetent and unpromising persons who emigrate from Australia, but the most brilliant ones. The only way to prevent it is to make available in Australia employment sufficiently attractive for them, and which will enable them to apply the skill they have acquired in the technical training they have undergone. Radio is one such avenue of activity, and we should do everything we can to encourage its development in Australia. Besides representing the New South Wales Chamber of Manufactures, I am here to-day also as the representative of the Radio and Telephone Manufacturing Association, which is a section of the Chamber of Manufactures. In Australia there are at present engaged in the manufacture of radio and telephone apparatus, Amalgamated Wireless Limited, Stromberg Carlson (Australia) Limited, and Air Zone Limited, besides many smaller firms. I do not know how the price of Australian manufactured radio and telephone goods compares with similar imported articles. I understand that an impressive list of installations has been made recently in connexion with the lighthouse services. In my opinion it would be a backward step to lay a telephone cable between Tasmania and the mainland. Modern development is all in the direction of radio services. Eventually, I have no doubt, it will be possible to obtain secrecy in radio communication.

53. *To Senator Sampson.*—I believe that a telephone service, whether by wireless or cable, would be largely used by business men in Sydney. Of course, the Tasmanian business is small in comparison with that from other States; but it is not negligible. One argument in favour of installing a wireless service is that at least 80 per cent. of the equipment can be made in Australia, whereas a cable has to be imported. Even the labour for laying it is brought from overseas. My experience is that there is an increasing tendency to use the telephone for communication between Melbourne and Sydney; and I have no doubt that, were a telephone service installed between Tasmania and the mainland, this service, rather than the telegraph, would, eventually, be used for the greater part of the traffic. A telegram is used to convey a message; the telephone is more generally employed when there is something to discuss pro and con.

54. *To Senator Reid.*—I was told by one of the radio manufacturers that the statement had been made to the Public Works Committee in Canberra that none of the radio telephone equipment necessary for the Tasmanian service could be made in Australia. Even though a wireless telephone service would not at present be so reliable as a cable service, I should still favour radio, especially having regard to the capital cost of installing the two systems. A telephone service to Tasmania would be of great service to Sydney business men, and would be availed of to a large extent by their representatives from Tasmania who desired to keep in touch with their head offices. Of course the bulk of the Tasmanian trade is done by Melbourne. Sydney business men admit that, in regard to most lines, they cannot compete with Melbourne. We favour the installation of a radio telephone service because practically all the equipment can be made in Australia, because such a service would be cheaper to install, and because the modern trend is definitely in favour of radio rather than the cable as a means of communication.

The witness withdrew.

Alfred Keil Jones, Commission Agent, Sydney, sworn and examined.

55. *To Senator Dooley.*—I have become aware, through reading the press, that it is proposed to connect Tasmania with the mainland of Australia by means of a telephone service. Our firm, which is engaged in the produce business, spends between £100 and £500 a year on telegrams to Tasmania. This involves a fairly large daily use of the telegraph. If a telephone service were installed to Tasmania, our use of it would depend largely upon the cost per call. If the charges were about the same as for telegrams, the telephone would, I am sure, be used in preference. Information about markets and supplies must be sent every day, and the produce trade would use the telephone rather than the telegraph if the cost were reasonable. Personal conversation is always preferable to a telegraphic message. It takes generally two hours to get a reply even to an urgent telegram, and even with interruptions to a radio telephone service you would probably get your call through within that time. For about seven months in the year we are working at high pressure with Tasmania. Our firm deals principally in potatoes and onions. Those merchants dealing in apples would also, I have no doubt, use a telephone service if it existed; but as their market is not so fluctuating as ours, their need for constant communication would not be so great. If we could put a call through to Tasmania for 2s. 6d., we would do it in preference to spending 1s. 4d. on a telegram; even if we had to pay as much as 3s. for a call, we would still use the telephone, but if the charge were as much as 4s. it would be regarded as a little too much for extensive use.

56. *To Senator Reid.*—I do not think that any difficulty would be encountered in using the trunk telephone line from Sydney to Melbourne, and then the link across Bass Strait. At present we frequently use the 'phone to call Melbourne and even Adelaide, and the communication is always good. A Tasmanian telephone service would provide revenue at both ends, because the Sydney firms have, in Tasmania, agents who would be putting calls through to their head offices. Sometimes we would telephone the growers, especially if they were connected with exchanges, which would enable us to communicate with them during hours when we could get reduced rates. However, we generally do our business with agents in Tasmania, who in turn communicate with the growers. Unless the charges for a service to Tasmania could be made something lower than the ordinary trunk charges, I do not think that the service would be availed of a great deal by our people. For instance, if we had to pay 5s. to get through to Melbourne and another 2s. 6d. to be connected up with Tasmania, we would much prefer to send a night lettergram of 30 words for 1s. 3d. Given reasonable charges, I believe that the telephone traffic would grow rapidly. When a facility is available, the tendency is for the public to use it increasingly, and to become careless of the cost. There are about twelve produce merchants in Sydney who deal with Tasmania, and they keep about twenty agents in Tasmania. Besides these, very many of the growers in Tasmania would, upon occasion, employ the telephone service if it existed. As I have said, our firm spends between £100 and £500 a year on telegrams. Other firms spend considerably less, but it would be safe to say that they spend on an average £200 a year each.

57. *To Senator Sampson.*—From one point of view the lack of secrecy with a wireless telephone service might be regarded as a disadvantage by produce merchants; but on the other hand it must be remembered

that even with an ordinary telephone service the wires sometimes become crossed and conversations are audible to listeners. In our business, we would use the telephone a good deal in what are ordinarily the slack hours; that is, at night and in the early morning.

(Taken at Melbourne.)

MONDAY, 1st DECEMBER, 1930.

Present:

Mr. GREGORY, in the Chair.

Senator Reid	Mr. M. Cameron
Senator Sampson	Mr. Holloway
	Mr. Long.

Lawrence Bede Fanning, Chief Inspector of Telephones, Postmaster-General's Department, Melbourne, sworn and examined.

58. *To Mr. Gregory.*—I am aware of the reference to the committee of the proposal to establish telephonic communication between the mainland and Tasmania. It is in conformity with the general scheme formulated by the postal department to link together all States of the Commonwealth by means of the telephone. The absence of telephone facilities to both Western Australia and Tasmania has placed these States at a very considerable disadvantage as compared with the rest of the Commonwealth. It is anticipated that early in the New Year a telephone service will be established between Perth and Adelaide. Until quite recent times the matter of opening a telephone service between Victoria and Tasmania has been surrounded with almost insurmountable obstacles. Modern scientific developments, particularly the improvements effected in the design of submarine telephone cables, have now made it practicable to establish this service on a satisfactory basis. Detailed statements of the alternative methods by which communication could be established, namely (a) by means of a radio telephone system, or (b) by means of a submarine telephone cable, have already been furnished to the Committee, together with estimates of the relative costs involved. The possible use of this service has been carefully investigated, and the proposal has been discussed with representative business firms both here and in Tasmania. These inquiries have proved that if a stable service is assured and all calls are connected within a reasonable period from the time of lodgment, the service will be used quite extensively. A statement is attached showing the probable traffic and revenue each year from the initiation of the service until the 15-year period. Included in this are estimates of the number of separate channels necessary to meet the increasing yearly demand on the service which it is anticipated will be forthcoming. In determining the volume of business due regard has been paid not only to the community of interest which it is known exists between Tasmania and the mainland, but also to the Department's experience when it established similar facilities between the capital cities in the eastern States of the Commonwealth. It will be observed, from the figures appended, that if telephone communication were established on a basis that would permit of a good service being continuously available and with sufficient channels to enable service to be given with reasonable promptitude, 114 calls daily would be forthcoming at the outset. This comprises 100 between Tasmania and the mainland, and fourteen to and from King Island. The estimated revenue for the first year is £8,033. It is estimated that in the fifth year the daily load would

increase to 187 calls and the revenue would be approximately £13,267. In the tenth year it is expected that the daily load would increase to 292 calls and the revenue would be £20,805. The estimated annual increase in business is probably on the low side when compared with the known increases that have taken place in the business transacted over the interstate trunk line channels on the mainland. In this respect the revenue earned on the Sydney-Melbourne group of circuits has increased during the past five years from £33,229 to £70,757, or an increase of approximately 111 per cent. During the same period the revenue on the Sydney-Brisbane system increased from £12,775 to £28,186, equalling approximately 130 per cent. Between Melbourne and Adelaide the revenue increased from £10,708 to £22,112, equalling 106 per cent. That there is a growing demand for improved telephone trunk line communication is evidenced by the fact that during the last five years the number of telephone trunk line calls originated in the Commonwealth has increased from 21,000,000 to 35,000,000, an increase of 63 per cent., and the revenue earned from these calls during the same period increased from £770,000 to £1,600,000, an increase of 105 per cent. There are indications that in Tasmania also the telephone using habit is rapidly developing. During the last five years the number of telephones in use has increased from 10,753 to 14,542, an increase of 35.2 per cent. During the corresponding period the number of telephone trunk line calls has increased from 1,000,000 to 1,500,000, and the revenue therefrom has increased from £30,000 to £49,000. Local telephone calls have gone up from 6,000,000 to 9,000,000. In calculating the revenue that would be derived from this service it has been assumed that the charges for calls will be based on the direct or radial distance between Tasmania and other parts of the Commonwealth. On this basis the charges for calls would be as follows:—

	Charge for a Three-Minute Conversation.		
	Day Rate.	Intermediate Rate.	Night Rate.
Melbourne-Hobart	s. d.	s. d.	s. d.
Melbourne-Launceston	4 6	3 5	2 3
Melbourne-King Island	3 6	2 8	1 9
Melbourne-King Island	2 6	1 11	1 3
King Island-Hobart	3 6	2 3	1 9

In arriving at the annual revenue due allowance has been made for extended calls, "particular person" calls, and the estimated distribution of business over the varying rate periods. The foregoing revenue figures have been based on the provision of a stable service with sufficient channels to meet the normal demand. If it should be decided, however, to meet the position by the provision of a single radio telephone channel the traffic and revenue figures forecasted would be subject to considerable modification. Radio telephone channels at best can only provide an irregular service and are subject to disturbances which, at times, result in a complete cessation of the service. This is supported by the experience gained in operating the Anglo-Australian radio telephone channel. It is estimated that the maximum number of calls which a satisfactory radio channel would be capable of carrying would be 50 per day. The normal busy hour load in calls on this basis would be approximately 6 or 7. On the basis of 50 calls a day the annual revenue from the radio channel would be approximately £3,500. Moreover, the radio service would not be secret, although it is technically possible to install apparatus which would invert speech passing over the radio circuit making it more or less unintelligible to any one not equipped with the apparatus necessary to listen in. The application of this device to the radio channel at times tends to impair it:

efficiency, with a possible reduction in the effective availability of the service. Viewed from the standpoint of efficiency the cable proposal has very marked advantages over the proposed radio link. It would provide a more stable service, and would be continuously available. It would also be free from those

interruptions and variations in the quality of speech which are characteristic of all radio telephone links. An important aspect also is that the installation of a submarine cable would permit of sufficient channels being made available to meet normal development for a considerable period to come.

PROPOSED TELEPHONE CABLE BETWEEN TASMANIA, KING ISLAND, AND THE MAINLAND.
STATEMENT SHOWING THE ESTIMATED TRAFFIC AND REVENUE AND THE NUMBER OF CHANNELS REQUIRED.

Year.	Estimated daily load.					Estimated annual percentage increase in traffic.		Number of channels required.	Estimated annual revenue (based on radial tariff).			
	Calls.			Speech Periods.		Tasmania.	King Island.		Tasmania.	*King Island.	Total.	
	Tasmania.	*King Island.	Total.	Tasmania.	King Island.	Total.	Tasmania.		King Island.	Tasmania.	*King Island.	Total.
1st year	100	14	114	155	22	177	%	%	2	£	£	£
2nd year	125	15	140	194	23	217	25	6	3	7,275	795	8,033
3rd year	141	16	157	219	25	244	12½	5	3	9,094	795	9,889
4th year	155	17	172	240	26	266	10	5	3	10,258	835	11,093
5th year	170	17	187	264	26	290	10	2½	3	11,276	877	12,153
6th year	187	18	205	290	28	318	10	2½	3	12,368	899	13,267
7th year	205	18	223	318	28	346	10	2½	4	13,604	921	14,525
8th year	225	19	244	349	29	378	10	2½	4	14,914	944	15,858
9th year	247	19	266	383	29	412	10	2½	4	16,369	968	17,337
10th year	272	20	292	422	31	453	10	2½	4	17,969	992	18,961
11th year	288	20	308	443	31	474	5	2½	5	19,788	1,017	20,805
12th year	300	21	321	465	33	498	5	2½	5	20,807	1,042	21,849
13th year	315	21	336	488	33	521	5	2½	5	21,825	1,068	22,893
14th year	331	22	353	513	34	547	5	2½	5	22,916	1,095	24,011
15th year	348	22	370	539	34	573	5	2½	5	24,080	1,122	25,202
										25,317	1,150	26,467

* The revenue for King Island has been computed at the actual percentage rate shown. The loading figures for King Island traffic are to the nearest whole number.

The estimate of the probable traffic and revenue, from the initiation of the service to the fifteen-year period, is based on our knowledge of the development of traffic following the establishment of telephonic communication between the other capital cities of the Commonwealth. The Sydney-Melbourne line was opened in 1907. In the following year the traffic increased by 20 per cent., and in 1909 by 25 per cent. Up to the present time, there has been no marked decrease in business or revenue from the Sydney-Brisbane, Sydney-Melbourne or Melbourne-Adelaide group of circuits; but there has been a falling off in the ordinary local and trunk line business. The estimated traffic and revenue figures between the mainland and Tasmania are based on normal conditions. We have reason to hope that we shall get back to normal in the not distant future. Our estimates of trunk line business are based on departmental figures up to the 30th June, 1929. The position would not have been altered if we had taken the figures up to the 30th June last, because trunk line traffic between the capital cities had not, up till then, been affected by the business depression. On the contrary, in the last five years the revenue earned by the Sydney-Melbourne group of circuits has increased by 111 per cent. In 1928-29, the revenue from that group amounted to £58,000; in 1929-30, it was over £70,000. The Sydney-Brisbane circuit in 1928-29 earned £26,000; and in 1929-30 over £28,000, while the Melbourne-Adelaide circuit in 1928-29, earned £18,000, and in 1929-30, over £22,000. Speaking generally, the effect of the depression on the telephone branch of the department's activities was not seriously felt until April of this year. Since then the cancellations of subscribers' lines exceeded gross connections by 4,126. At the present time there are 391,575 subscribers' lines connected throughout the Commonwealth and 515,681 telephones. To ascertain the number of calls likely to be received from each end of the proposed telephone system between the mainland and Tasmania, officials of the department interviewed representative business men in Melbourne, Hobart and Launceston. In Melbourne over 100 firms having either commercial or financial interests in Tasmania were asked if they would be likely to make use of the service. Nearly all of them stated that they would do so, but, naturally, they could not say to what extent.

Similar inquiries were made in the north and south of Tasmania. From this information an estimate of the probable daily telephone traffic was built up. This figure was checked by examining the known telegraph business to Tasmania, and applying thereto the ratio of telephone to telegraph business between the interstate capitals on the mainland. The estimated development in business, from year to year, is largely based on our experience of the development of telephonic business following the opening of the Sydney-Melbourne, Sydney-Brisbane and Melbourne-Adelaide circuits. As I have already stated, in the first two years, the business between Melbourne and Sydney increased by 20 per cent. and 25 per cent. respectively. Between Sydney and Brisbane, the increase in the first year was 80 per cent., and in the second year, 80 per cent. over the first year. Between Melbourne and Adelaide the increase was 42 per cent. I do not think it is possible to estimate the extent to which the telegraphic business is affected by trunk line telephone services. The figures show that, even before the introduction of long-distance trunk telephone lines, telegraphic business was showing a loss. In many respects the problem as represented by telephonic and telegraphic competition is somewhat similar to that of the railway departments in the various States, because of the development of motor traffic. In the last report of the Postmaster-General, the losses on telegraph service for the last five years are shown thus:—1923-24, £188,000; 1924-25, £227,000; 1925-26, £308,000; 1926-27, £278,000; 1927-28, £312,000; 1928-29, £228,000. On the telephone side the losses have been:—1924-25, £258,000; 1925-26, £296,000; 1926-27, £339,000; 1927-28, £322,000; 1928-29, £247,000. These figures take into consideration interest on capital invested, working expenses and depreciation. I cannot say to what extent depreciation is provided for; the rate varies with the type of equipment used. Although the losses have been heavy in the two branches mentioned, the profit and loss account of the department shows that the earnings of all branches in 1928-29 amounted to £12,933,835 as compared with £12,325,082 in the preceding year, or an increase of £608,000, and the actual profit, after providing for interest charges and working expenses, was £56,524. Although the figures are

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not available yet, it is anticipated that the additional revenue resulting from the recent increase in telephone charges, will substantially reduce the losses in that branch.

59. *To Senator Sampson.*—The charges for telephonic services in Australia are lower than in most other countries, as will be seen, from the following figures:—

TELEPHONE RATES, SEPTEMBER, 1930, WITHIN 2 MILES OF AN EXCHANGE.

	£ s. d.		
Australia (Sydney and Melbourne)	5 10 0		1½d. per call
England (London)	8 0 0		1d. per call
New Zealand (Wellington)	15 0 0		includes calls
South Africa (Cape-town)	9 0 0		900 calls free, 1½d. each additional call
Canada (Montreal)	18 0 0		includes calls
America (New York)	15 0 0		includes 1,200 calls p.a.
India (Calcutta)	16 15 0		includes calls

The telephone trunk rates here also are lower than in other countries, as will be seen from the following table:—

Mileage.	Australia.	England.	United States of America.	South Africa.	New Zealand.
Up to 10	0 4	0 3	0 5	0 3	0 4
Up to 50	0 10	1 6	1 10½	1 0	0 10
Up to 100	1 6	2 6	2 11	1 9	1 8
Up to 250	3 0	4 6	5 5	5 0	3 4
Up to 500	5 3	7 6	8 6½	10 0	5 5
Up to 800	7 6	10 6	12 6	16 0	7 11

The variation in rates in Australia is also more advantageous to the telephone user in Australia than in the United States of America. There are three periods. Full rates periods operate between 9 a.m. and 6 p.m. Between 6 p.m. and 9 p.m., and also between 7 a.m. and 9 a.m. an intermediate rate operates, which is 25 per cent. lower than the full day rate. After 9 o'clock at night and up till 7 o'clock the next morning, the rate is practically one-half the day rate. I do not know of any long-distance trunk line service, even in Sweden, which charges rates lower than ours. It is the practice of the department to base trunk line charges on the air line distance between the terminal points. The charge for telephone communication between Melbourne and Hobart will be calculated on that basis, irrespective of the form of communication adopted, whether wireless or cable. It is the practice in most countries to base rates on air-line distances. I favour a submarine cable between the mainland and Tasmania as against wireless communication, as, of the two systems, a submarine cable will be more suitable and will cope more efficiently with the normal development in traffic which, we anticipate, will take place. A radio telephone channel has its limitations. The view of the department is that people living in all the principal centres should be treated uniformly in the matter of telephone facilities and charges; that if a loss is sustained on any particular circuit, it should be covered by the service as a whole. If charges were based on the cost of a service, there would be few telephones in country districts, because of the high cost involved. I have no technical knowledge of a radio-telephone service, but I have had some experience of the operation of the Anglo-Australian wireless system. That service is a good one, but it is limited to certain hours of the day. It is available from about midnight until 2 a.m. or 3 a.m., and again in the afternoon, at present from 5 p.m. to

7 p.m., or perhaps a little later. The service works satisfactorily on the whole, but it takes much longer to dispose of a call over a radio than over a physical channel. It is necessary to extend the time of practically every call. It may be of interest to members of the committee to know that we charge for only 80 per cent. of the time during which radio telephone users are actually connected. It would not be necessary to make the same provision for lost time in the case of a submarine telephone channel. It would give the same good service as the land line between Melbourne and Sydney. It is unusual to give an extension of time on a land line service except where the circuit is working badly, and this is the exception, not the rule. On the Anglo-American service there are four channels in use—three short wave and one long wave circuits. Recently, the working of that system was discussed with Mr. Griffiths, an officer of the postal service in London, and he stated that the four channels rarely worked simultaneously. The average daily number of calls is 60. He also stated that, assuming the very best conditions prevailed, the maximum number of calls per day that could be disposed of over a single radio channel would be 40. Estimating on this basis, I feel sure that one radio channel between the mainland and Tasmania would not be sufficient for the volume of traffic offering. At least two would be necessary, even at the outset. Because of the short distance between the terminal points, a radio channel between Victoria and Tasmania might work more efficiently than the Anglo-American service. I do not think it is possible to forecast accurately what will be the carrying capacity of one channel. Our experience indicates that, for some portion of the 24 hours, at all events, the service would fail entirely. It is estimated that a submarine cable telephone service would provide sufficient revenue to cover annual charges in the ninth year. On the Sydney-Melbourne trunk line system, which is subject to very little interruption, there are eight channels, and the average number of calls put through daily on each channel is 80. The Sydney-Brisbane system handles an average of 89 calls on each of its three channels, and the Melbourne-Adelaide 71 calls on each of three channels. The busiest hour of the day is between 9.30 a.m. and 10.30 a.m., during which time the average number of calls per channel on the Melbourne-Sydney and Sydney-Brisbane groups is ten. The average busy-hour calls per channel between Melbourne and Adelaide is nine. Between 7 a.m. and 11 p.m., the average hourly load per channel on the Melbourne-Sydney circuit is 5.8 calls; between Sydney and Brisbane it is 5.6, and between Melbourne and Adelaide, 5.4 calls. On single circuits, such as those operating between Newcastle and Tamworth, the average number of daily calls is 71, and the busy-hour calls, nine. Between Sydney and Singleton the average daily calls number 79, and the busy-hour calls ten. Between Melbourne and Kerang the average daily calls number 75, and the busy-hour calls nine. Between Perth and Collie, the daily calls average 62, and the busy-hour calls eight. These are calls normally dealt with on services continuously available and reasonably free from interruptions. Obviously, the carrying capacity of a radio channel, which is known to suffer from certain disabilities, must be less.

60. *To Mr. Holloway.*—A submarine telephone cable would give a perfectly satisfactory service, and except in the case of an accident, it would carry traffic equal to the figures which I have given for the various land lines on the mainland.

61. *To Mr. Gregory.*—I am afraid I cannot state to what extent the cost of the submarine cable would exceed that of a trunk land line over the same distance, but I know it is more expensive. The estimated

cost of the cable alone is £112,000. The estimated annual charges of the submarine cable are lower than the radio system. All of the trunk line services between the mainland capital cities are profitable, but losses are being incurred on certain intra-State trunk line services, as well as on country exchange services.

62. *To Mr. Holloway.*—The local telephone services in the capital cities show a small profit on working results. It has always been a feature of departmental policy to provide telephone facilities to isolated communities in rural areas, even though their construction and working would show a loss.

63. *To Senator Sampson.*—I am not in a position to say what would be the view of the department if a responsible company undertook to establish and maintain a radio service to Tasmania in return for a small subsidy. In the case of the radio links between Australia and England, and between New Zealand and London, Amalgamated Wireless (Australasia) Limited, shares the revenue with the various administrations concerned. The transmitting and receiving stations used in the Australian terminal in connexion with the Anglo-Australian and Australia-New Zealand radio telephone services are owned by Amalgamated Wireless Limited, and are operated under licence from the Postmaster-General. The New Zealand service was opened on the 25th of November, and the tariff is £3 for three minutes. Of this amount, New Zealand gets £1 4s. and Australia £1 16s., of which sum the Post Office receives 13s. 6d. and Amalgamated Wireless £1 2s. 6d. Between Australia and England, the tariff is £6 for three minutes. Of this sum Great Britain receives £3 and Australia £3; but the Commonwealth Postal Department is credited with only 15s., and the balance, £2 5s., goes to Amalgamated Wireless. Between Australia and the United States of America the tariff for three minutes is £9. Of this sum the United States of America receives £2 5s., Great Britain, £4 10s., and Australia, £2 5s.; but the Post Office receives only 11s. 3d., the difference, £1 13s. 9d., being paid to Amalgamated Wireless.

64. *To Senator Reid.*—Australia stands sixth in the order of countries showing the greatest density of development as regards telephone users, the number of telephones in use being nearly eight per 100 of population. In the United States of America the percentage is 16.3; in Canada, 13.7; in New Zealand, 10.2, and in Denmark, 9.4. For the last five or six years there has been a progressive loss on the working of our telephone systems, the average loss being about £1 for each subscriber. As the larger provincial centres are included in the figures relating to country telephone services, I cannot say, off-hand, whether or not the telephone services in some of the larger towns are paying. Without committing myself, I should say that they are not, because the rental charge is comparatively low. I do not know of any radio telephone service in operation that could be compared with the proposed service between the mainland and Tasmania. The New Zealand service, which was opened only on Wednesday last, is available from 9 a.m. to 7 p.m., but there are periods during which it goes off, notably about mid-day. It is too early yet to say what business that service is capable of handling; certain adjustments have yet to be made at the New Zealand end. On the first day it worked fairly well, but we could not dispose of all the business offering. The Anglo-Australian service has been operating for about six months. It was opened on the 30th of April. Out of 142 working days, the number of possible sections would be 154 afternoon, and 131 morning sessions. The service was totally uncommercial on nineteen afternoon and five morning sessions. These failures were due entirely to unfavorable radio or atmospheric conditions. On the Anglo-American service, there are four channels. I

have made a number of satisfactory calls to America. The Anglo-American service has, at times, completely failed. I am not competent to speak as to the meteorological conditions in Bass Strait. Any opinion which I have expressed on the working of radio telephone channels have been based on my observations of the working of the Anglo-Australian service, and what I have learned of the Anglo-American service.

65. *To Senator Sampson.*—With, possibly, one or two exceptions, the whole of the telephone subscribers in Tasmania would be able to make commercial use of the proposed telephone service to the mainland; but if the radio system is adopted, residents of King Island would be cut out. A submarine telephone cable service would be reasonably secret. On the Sydney-Melbourne service a carrier wave system is in use, and it is practically impossible for any unauthorized persons to listen in to conversations. Even if they were equipped with the necessary apparatus it would be impossible to make anything of a conversation passing over the special carrier wave. A normal telephone trunk line service may be regarded as confidential, although, at times, some leakage occurs. A radio telephone conversation, on the other hand, is not necessarily confidential. Every person possessing a short wave set, if he is sufficiently interested, may pick up telephone messages from Australia to London. By the use of the voice inversion apparatus, unauthorized listeners are unable to make anything of a message that is being transmitted. I have no doubt that, because of the close business relations between Tasmania and the mainland, full advantage will be taken of whatever system is adopted.

66. *To Mr. Long.*—I am sure that the installation of a telephone service is strongly favoured by the business people in Tasmania. Because of the proved secrecy and continuity of service to be expected with a submarine cable, as compared with a radio channel, I should prefer that system. I understand that the estimated cost is about £181,000, and that the annual upkeep will be £18,000, whereas the capital cost of one radio channel is approximately £56,000, and the annual upkeep £19,000. Our figures relating to estimated revenue have been based entirely on the ordinary calls and rates, and include anticipated revenue from extended calls. Between 9 a.m. and 6 p.m. the charge for a call on the Sydney-Melbourne line is 5s. 3d. Our experience shows that on interstate circuits 55 per cent. of the calls are extended beyond the initial period of three minutes. We anticipate that for the first eight years a submarine telephone service will be a losing proposition, but that in the ninth year it should pay working expenses and interest, and provide for a sinking fund. I consider that Tasmania should have a service equal in every respect to the services between mainland capital cities. The possibility of an accident to a submarine cable is remote. I am not sure, but I believe the first telegraph cable to Tasmania was laid about 60 years ago.

67. *To Mr. Holloway.*—Because of the shorter distance it is possible that a radio service between the mainland and Tasmania would work more efficiently than the service between Great Britain and America. I would not regard a submarine cable telephone as an old system; at least not a cable of the type that we should lay. Such remarkable developments have been reported in recent years in the manufacture of submarine telephone cables that it is now proposed to lay a cable between Newfoundland and the west coast of Ireland, at a cost of £2,500,000. This new service, when available, will be used as supplementary to existing radio links. The probability is that, but for recent scientific developments, a submarine telephone cable to Tasmania would not be feasible. It is difficult to forecast future developments in connexion with radio telephony or

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to what extent it will be used in place of physical tele-
phone plants. All that I can say on that point is that
five years ago I was asked, in view of the possibilities
of radio, if we should be justified in incurring certain
expenditure on physical telephone plant. I expressed
the opinion that certain works then in contemplation
should not be delayed. Subsequent events have justified
the course I then advocated. Looking to the future
now, I cannot see any developments that would justify
deferral of the laying of a submarine telephone cable
to Tasmania; but, as I have stated, it is difficult to
forecast what the future holds for us.

68. *To Mr. Cameron.*—Our experience shows that
existing trunk line circuits are not used exclusively by
business people. Some time ago I endeavoured to
ascertain who were using the lines principally, and I
found that calls were being put through by practically
all sections of the people. Some business houses had as
many as ten or twelve calls a day. Many trunk line
calls are of a social character. An examination of the
nature of calls on the Anglo-Australian service has
shown also that 45 per cent. are of a social nature.
It is anticipated that the business transacted over the
Tasmanian system when it is in operation will be of a
business and social character much the same proportion
as on the services between the capital cities on the
mainland. I am looking for satisfactory business
between Tasmania and Sydney, because of the large
business interests between that city and Tasmania.
Our inquiries have shown that there is a definite com-
munity of interest between the several capital cities.
Between Adelaide and Sydney, for example, the trunk
line telephone business returns a revenue of £500 a
month, and between Melbourne and Brisbane it was as
high as £300, for the four weeks ending the 4th of July
last. When the carrier wave system was introduced
between Sydney and Melbourne, and the circuits
increased from three to six, the traffic increased
by 164 per cent. There is also considerable trunk
line telephone business between provincial centres
in the various States and the different capital
cities. The business depression was felt first in
the metropolitan areas. In October the total cancell-
ations in the capital cities were 2,417 lines, and in
country districts for the same period 1,071. For the
previous month the cancellations in the metropolitan
areas totalled 2,502, and in the country districts 933.
In October the applications for new telephone services
numbered 1,445 in the metropolitan areas, and 810 in
country districts. In the same month the net loss in
the country districts was 261, and in the capital cities
972, or a total of 1,233. Owing to financial stringency,
applications for new telephone services in the country
are being refused, which in normal times would be
granted.

69. *To Mr. Holloway.*—It is difficult to say whether
or not the diminution in aggregate revenue is in the
same proportion as the decrease in the number of tele-
phone subscribers. Accounts for subscribers' calls are
rendered at the end of each six months, and it is not
possible to indicate yet whether the subscribers' calling
rate is being curtailed. I do not think there is any
doubt that it is being reduced.

69a. *To Mr. Cameron.*—In October the net loss in the
number of telephones in Tasmania was 18 in Hobart
and 11 in the country, compared with 18 in the capital
city and 7 in the country for the previous month.
During the same month the applications for new tele-
phones numbered 31 in Hobart and 52 in the country.
In September the figures were, 33 for Hobart and 45
for the country.

70. *To Mr. Gregory.*—Naturally, I wish to see the
most efficient service established. If the capital cost of
a submarine cable will mean delay, possibly it would
be better to give the people of Tasmania some other
form of communication; but speaking from experience,

I am convinced that once a service is established, if
it is not satisfactory there will be an agitation for a
better one. Subscribers will not be content to wait
possibly for two or three hours to get a connexion be-
tween Tasmania and the mainland. If the financial
situation were different, I would not hesitate to recom-
mend the installation of the submarine cable as the
system more likely to give the best results; because it
may be expanded, without much additional cost, to
meet all the developments in traffic that are likely to
take place.

71. *To Mr. Long.*—I do not think there is much
doubt about what will happen if the radio system is
adopted. If the service does not give satisfaction, the
people will demand a better one. Although the capital
cost of one radio channel may be relatively low, con-
sidered side by side with the cost of a submarine cable
providing several channels, the annual charges are
higher.

The witness withdrew.

Harry Percy Brown, Director-General of Posts and
Telegraphs, Melbourne, recalled and further
examined.

72. *To Mr. Gregory.*—Since last I gave evidence
before the committee, I have had an opportunity to
peruse evidence given by Mr. Fisk, managing director of
Amalgamated Wireless (Australasia) Limited, and I
understand that the committee wishes to hear my views
in connexion with certain matters referred to by Mr.
Fisk, relating primarily to the question of costs and
the suitability or otherwise of a radio service. The
copy of the evidence with which I have been furnished
gives Mr. Fisk's opinion that the departmental esti-
mates are excessive. In this connexion may I refer
to the Rome-Sardinian service mentioned by Mr. Fisk.
This equipment is stated to cost £56,000, and it is
to be inferred that the sum covers only the radio
installation. Mr. Fisk does not advise the adoption
of such a system, although one would expect that the
Marconi Company and the Italian authorities would
not be disposed to make such a heavy investment if
they did not consider the expenditure to be warranted.
It is an interesting point to consider the relative use
which may be made of the Sardinian equipment as
compared with that which would be needed for a Tas-
manian service. The number of telephones per 100 of
the population in Italy is only .4 compared with more
than seven in Australia. It is conceivable that the
Sardinian telephone density would be still less than
that of Italy as a whole, possibly not more than .2;
but even if the figure were taken on the basis of .4
telephones per 100 of the population, the number of
telephones would be under 4,000 as compared with
14,500 telephones in Tasmania. The point is that if
the Marconi Company and the Italian authorities
think it necessary to spend £56,000 on radio equipment
to serve less than 4,000 telephones, it does not seem
unreasonable that this department should have esti-
mated that approximately the same amount, namely,
£55,630, would be needed for a radio equipment serv-
ing a territory containing 14,500 telephones, and the
department's estimate includes also land lines, resi-
dences for operators, and trunk terminal equipment.
Nevertheless, Mr. Fisk would not advocate an expen-
diture of this magnitude, but states that the sort of
service he advocates can be installed at a cost of £10,000
for a sending and receiving station, which represents
a total of £20,000 for the radio equipment at both ends.
It is an entirely erroneous assumption that a complete
service of this character can be made available at such
an expenditure. I endeavoured to make it clear in my
earlier evidence that a radio service does not lend itself

so readily to interconnection with the land line telephone service as does a cable link. Heavy additional costs are entailed in the provision of circuits from the receiving and transmitting stations, and also of the special equipment needed at each terminal for converting the separate incoming and outgoing channels to a system of duplex working over a single channel which may be connected directly to the single channel services of the telephone network. The actual costs for radio equipment, extracted from the department's estimates, which have already been given to the committee, amount to a total of £21,320, and it is this figure which is directly comparable with Mr. Fisk's quotation of £20,000. The disparity is not great. The Department anticipates that an emergency power plant would be necessary at the radio stations to maintain the service in the event of interruption to the normal supply, and it has included in its estimate an additional £3,500 for this purpose. The difference between the amount mentioned for the radio installations and the total quotation of £55,630 is made up on sites, buildings, residences, trunk line connexions between radio stations and the telephone trunk exchanges, and special terminal apparatus. It is clear, therefore, that even on Mr. Fisk's own estimates of radio costs the total departmental estimated figure is not unreasonable. Reference is also made in Mr. Fisk's evidence that the annual charges of £18,840 estimated by the department are excessive. Perhaps the most convincing analysis of the position may be afforded by indicating the relationship between Mr. Fisk's offer to render a 24 hours' leased service at a cost of £12,258, and the annual charges extracted from the department's estimate in respect of the equivalent service. This figure amounts to £13,257, and covers the whole of the annual costs on sites, buildings and complete radio installations at both ends. The difference between this figure and the total annual charges for the service given in the department's estimate at £18,840 is in respect of the annual charges on residences, connecting lines and terminal equipment including the operation of the latter. On the question of the carrying capacity of the radio link, I dissent from the view that this would be equal to 100 calls per day. I do not think there is any service in the world where an equivalent volume of traffic is being disposed of on one radio channel. Such a loading is much above the average which the department is able to secure on a land line circuit of high efficiency, free from interruptions, and operated on the most expeditious basis attainable. It could scarcely be expected that under radio conditions, even though they were almost ideal, equivalent efficiency of operation to that on a high grade line circuit would be practicable. The special means necessary for inter-connecting the radio link with the telephone network, and the additional supervision needed, are factors which must be allowed for. The average call contains about one and a half speech periods of three minutes' duration, and with single circuit working the output seldom reaches 90 speech periods per day. In my view, the estimate of 50 calls per day, representing 75 speech periods, which formed the basis of the department's assessment of annual revenue, is very reasonable. It must be borne in mind that there is seldom an even flow of traffic on any communication service throughout a period of 24 hours. The committee may be interested to know that in the Commonwealth the ratio of the full day's load to the busy hour on the trunk service is as seven to one, which means that the carrying capacity of the plant is only effectively used to the extent of seven hours in 24, and the ineffective time is consequently about 71 per cent. The evidence also refers to the extra cost which would be entailed in providing additional traffic capacity, stating that this would depend upon the number

of hours during which the calls are to be made. I think it will be quite evident to the committee that the capacity of any service must be based upon the demand in the peak period and the extent to which this is departed from is a measure of the inefficiency of the service and the inconvenience to be suffered by those who wish to use it. Where the distance between two correspondents is very great as, for example, between Australia and the United Kingdom, the comparative uncertainty of establishing telephone connexion at any particular time may not be of serious moment; but where the distance is short, it would be intolerable to expect users of the service to wait for hours and be uncertain as to the possibility of securing the connexion during business hours. The great popularity of the Commonwealth service has resulted almost entirely from the endeavours which have been put forward to eliminate waiting time, and give users an assurance that their connexions will be made with reasonable expedition and certainty. Business people cannot afford to depend upon a service which is uncertain, and which is also subject to normal heavy delays. I have no hesitation in saying that a single channel radio service will not meet the reasonable requirements of the Tasmanian public. Obviously, it would be better than nothing at all; but I cannot imagine that it would be long in service before a clamour was made, with some justification, for more extensive facilities. I would like to remind the committee that the cable proposal provides for five independent channels of communication from the outset, as against one covered by the radio scheme. Reference has been made in the evidence given to the committee that wireless is so much more flexible than a cable, and that a cable is merely a tunnel for communication having definite limitations. I suggest that the statement is misleading and unjustifiably disparaging to cable communication. The actual flexibility which wireless offers is that additional transmitters and receivers may be established from time to time when it becomes evident that the existing traffic carrying capacity is inadequate, whereas with a cable system the conductors provided in the first instance obviously cannot be increased in number after the cable is manufactured. On the other hand the cost entailed in providing more than one pair of conductors initially forms a very small portion of the total cost, in addition to which by superposing, and possibly also by the use of carrier, the actual independent channels which may be established are considerably in excess of the physical pairs included in the cable. The results of the studies which have been submitted to the committee indicate that for about the same annual cost it is possible to secure one radio channel or five cable channels. In the cable scheme submitted by the department to the committee, it is probable that the facilities will be adequate to meet all requirements for possibly fifteen to twenty years ahead, and there would be no increase either in capital cost or in annual charges during that period. When the department called tenders some time ago for the erection of a radio station to work between the mainland and Tasmania, Amalgamated Wireless quoted for the lease of channels of communication which the company offered to provide, and it was upon the figures contained in that quotation that I made a comparison between Mr. Fisk's costs and our own. His figure was £12,258 per annum. Mr. Fisk suggested that the department might lease the plant from the company at this figure for a 24-hours' service. We invited tenders for what is known as the directive short-wave system. Possibly, there is some misconception concerning the beam service. Experiments conducted by Signor Marconi showed that great distances could be covered by short-wave working, and later it became possible to use comparatively small aerials for the radiation of high

frequencies. From this point there was developed what is known as the reflector, which causes the beam to be concentrated in a path in much the same way as a searchlight is directed. Later developments indicated other means of directing the energy into a comparatively narrow channel. This directive system, which has been elaborated by the British post office and the American authorities, is being used in the Anglo-American service, and the Australian-New Zealand service. For the Tasmanian service we stipulated for what we anticipated would give a fairly good service. We considered that the short-wave system, working somewhere about 50 to 80 metres with directive aerials, would meet requirements. There is a good deal of speculation about a radio service. It is difficult to get any one to say definitely that if we do certain things we shall get certain definite results. We carried out a number of experiments between the mainland and Tasmania, and having obtained a fairly good idea of what we should have to do to secure a satisfactory service, we invited tenders for the equipment, giving the tenderers a margin within which to work. In other words, we specified our needs and invited the contractor to submit prices and to give certain guarantees. I do not know a great deal about the Rome-Sardinia service, so I cannot say what actuated the Italian authorities in their preference for radio as against a cable telephonic communication. One has to remember, however, that Signor Marconi is an Italian of whom Italy is justifiably proud; moreover, the question of relative wages has to be considered, and, further, it is possible that ocean currents may interfere with the successful laying and maintenance of a cable between the mainland of Italy and Sardinia. But this is all speculation. I do not know anything about the position, except that the number of subscribers is, I understand, not more than 2,000. Even if we put it at 4,000 one radio channel working with reasonable efficiency should be enough to carry the volume of business offering. On present figures, I should not think that a cable service would be warranted. The point to remember in connexion with the Tasmanian service is that, with the development of traffic anticipated, it will not be many years before we shall need four or five channels of communication, and it will be possible to provide these without additional capital expenditure. If a private company established and maintained a radio service, we should have to expend about £14,000 on land lines and apparatus to connect subscribers with the radio telephone service. The adoption of a radio channel would mean merely the saving of immediate capital investment, and its disadvantages would be obvious. If a radio channel were leased by the department there would be dual control of an important link in our communication services which is objectionable. I do not think anybody would voluntarily establish communication services of such a nature if it could be avoided. I have had many years experience of dual control in this class of business, and I know that it is unsatisfactory, even where a co-operative spirit is manifest. There are other objections. If we wish to make improvements from time to time, in order to keep in step with technical progress, it would not be easy to ask a contractor to do certain things, because this would mean further expenditure, and the contractor might quite justifiably say: "I am doing all that I undertook to do in the contract. I do not agree with your view, so I am not going to do any more." There would not be an incentive to install improvements, because additional expenditure on the part of a contractor would not mean an increase in earnings. Our estimate of the revenue from one radio channel is £3,500 a year, and we anticipate that the cost would be

£15,000 per annum. Apart from our own costs, I know nothing of the New Zealand service; but I do not agree with Mr. Fisk's statement that it is capable of handling ten calls per hour. I think this is borne out in his own statement; he mentions that at certain periods of the day wave length changes may be necessary to maintain communication, and these changes takes about two hours to effect. It would not be equitable to base tariff charges on the cost of a service. The aim of the department is to have uniform rates throughout the States, irrespective of the capital cost. We should, therefore, not be justified in imposing a special tariff on the users of the proposed Tasmanian service. In my view, the radio service would never pay, whereas a submarine cable would be returning a profit at the end of nine or ten years. Certain trunk lines in the Commonwealth pay well, because the cost per unit of channel is small owing to the large number of circuits on the same route, and the fact that the volume of business transacted is large. On the other hand, many lines in country districts are relatively expensive, because only a few circuits are accommodated on the route, consequently the cost per unit of channel is high. The proposed Tasmanian service would be an important link, and we believe that in time it will realize the volume of traffic shown in the schedule already before the committee. On that basis we estimate that a submarine cable would be a paying proposition in about ten years. I consider that it would be inadvisable to subsidize Amalgamated Wireless to establish and maintain the service. The figures show that the volume of business would not return a profit, so the Government would have to pay in any case. The question is whether it would be better for the radio link to be operated by Amalgamated Wireless or by the Government? This touches an important point in Government policy. I think the present Government's view is that all such services should be under Government control. The department would not welcome an important link in its communication service being maintained by a private company. The fact that the Government has one half interest in Amalgamated Wireless makes no difference. A company even of that character might conceivably be able to operate services at costs lower than is possible for a Government, because it is not required to make equivalent provision for sick leave, holiday pay, superannuation and other charges, which represent a considerable addition to the expenses of the Government department.

73. *To Senator Sampson.*—If a submarine cable is laid it will be possible to increase the capacity five-fold without additional expenditure. We estimate that it will not be practicable, even in the first year, to handle all the business on one radio channel. Moreover, radio communication will eliminate King Island from the scheme.

74. *To Mr. Cameron.*—In my opinion there is not a shadow of doubt that a radio service will not pay.

75. *To Mr. Holloway.*—I consider that it is absolutely impossible for Amalgamated Wireless to establish and maintain the service in return for a share in the revenue, and I doubt that it was even the intention of the company to enter into a contract like that, or that without a guarantee, it expected to operate the service at a profit. This view, I think, is borne out by Mr. Fisk's statement relating to the proposed charges. There is this further point. As Mr. Fisk's evidence suggests, the company wishes to strengthen its position, whatever that may mean. I assume, however, that the company would be especially anxious to secure a footing in the business of providing internal communications in Australia, similar to its association with our overseas communication services. Amalgamated Wireless is not receiving a subsidy in

connexion with the Anglo-Australian or the Australian-New Zealand services. It retains a share of the revenue earned at both ends.

76. *To Senator Simpson.*—The Postal Department collects the whole of the revenue for oversea services and pays Amalgamated Wireless its share at the agreed-upon rate.

77. *To Mr. Holloway.*—We have no apparatus in Tasmania that could be used in connexion with a radio telephone service, so we should have to go to the expense of obtaining it. It would not be possible for Amalgamated Wireless to cope with a large increase in the volume of business between Tasmania and the mainland unless it duplicated its plant. Mr. Fisk points out in his evidence that if an attempt is made to crowd double the number of calls into the same time, when the plant is already working to capacity, it is then necessary to add another channel of communication. He goes on to say that this would mean putting in another complete internal unit for transmitting and receiving, and that this would practically double the original cost for actual wireless apparatus. Each new radio channel of communication would mean further departmental expenditure at the terminal points. No terminal equipment would be necessary in the case of a submarine cable. We would bring the circuits right into our exchanges. Whether or not it is possible to provide telephonic communication with Tasmania cheaper by radio than by means of a submarine cable, depends on circumstances. Considered from the point of view of initial capital cost, the radio system would appear to be the cheaper; but if we bear in mind the anticipated increase in traffic, which may be handled over a submarine cable without additional capital cost, the cable appears to be the more economical scheme. It will provide five channels of communication, which will earn up to £20,000 per annum in ten years for an annual expenditure necessary to maintain one radio channel. Since it is the policy of the department to make the same basic charges on all trunk line services throughout the Commonwealth, the people of Tasmania would not benefit from the installation of a radio system. There is no doubt that ultimately a submarine cable would prove less costly to the government than radio communication. I do not wish the people of Tasmania to think that, if we establish a radio service, they will enjoy a lower tariff.

78. *To Mr. Long.*—Generally speaking, Mr. Fisk's estimates of cost are not below those prepared by the department. I regard the absence of secrecy in the case of a radio system as important, particularly to business men who use the telephone over short distances. Leakage of information with regard to business transactions might not be so important over the Anglo-Australian route, because of the great distance separating the persons concerned; but a leakage of information concerning business transactions between Launceston or Hobart and the mainland would probably be serious. A telephone service is unsatisfactory unless it is reasonably secret. Secrecy is ensured over our land lines, and would be in the case of Tasmania with a submarine cable as the channel of communication. The annual maintenance charges of a submarine cable are not a considerable item. An increase in traffic would, in the case of a radio system, call for a duplication of plant at almost double the initial cost, as well as involve the department in increased expenditure on terminal equipment and land lines. It would take about eighteen months to install a submarine cable system. Mr. Fisk's estimate for the installation of a radio system is nine months.

79. *To Senator Reid.*—A radio system between the mainland and Tasmania would, if established, be among the shortest in the world. For this reason, it would probably work more efficiently than similar services

over greater distances. I do not think there would be any undue difficulty in working this system between Tasmania and the mainland. Experiments which we have carried out show that we need not anticipate abnormal conditions arising; but I doubt that it would be possible to handle ten calls per hour. Over the Commonwealth trunk lines, with all the volume of business we are handling and the high quality of our land circuits, the plant is ineffective for nearly 75 per cent. of each working day, because telephone users do not make their calls uniformly throughout the day. There would be little traffic to or from Tasmania during the night-time. I do not think it is reasonable to expect Amalgamated Wireless to erect stations at a cost of £20,000 for the purpose of giving a service to Tasmania temporarily; moreover, heavy departmental costs also would be entailed. The department is called upon frequently to pay a subsidy for the purpose of maintaining public services. I do not think it would be possible to arrange to take over a service that might be established by Amalgamated Wireless, because we should not be able to acquire the plant. And if the service was not efficient, why should the department wish to take it over? Any scheme to establish a radio link temporarily would give rise to a difficult and delicate position. We would not be likely to get any guarantees from the company as to the quality of the service or the number of hours during which it would be available. If I were asked to summarize my objections to a radio service, I would say that a radio link will never be able to meet fully the requirements of a telephone service between the mainland and Tasmania; that it must always operate at a substantial loss; that secrecy cannot be ensured, although possibly this risk may be minimized by voice inversion; that it will not do anything for the people on King Island—they will still be without means of communication with the mainland; and that the period of interruption is an unknown quantity, but obviously it will be a serious drawback. On the other hand, a submarine cable service will from the outset provide for all anticipated developments during the next fifteen or twenty years without any addition to the annual charges, which will not exceed the cost of one single, and possibly somewhat indifferent radio channel. Furthermore, it will be secret and, except for unforeseen accidents, will be free from ordinary interruption. I am not aware of any probable developments in the science of radio telephony that will meet the objections I have mentioned. Progress is going on steadily, but there is no justification for the belief that we are on the eve of a revolution in radio communication. If there were, I am at a loss to understand why some of the most experienced financiers in the world are investing enormous sums in submarine cable telephonic systems.

80. *To Mr. Gregory.*—The voice inversion apparatus makes for secrecy in radio telephony, but it is safe to assume that what one man can do, another may do. That is to say, once the basis applied is disclosed, a certain measure of secrecy, at all events, is lost. There is nothing to prevent one nation, in a great national crisis, from tapping wireless services of other countries if it wished to do so, provided it had a knowledge of the system adopted. The apparatus I understand, costs between £2,000 and £4,000. If Amalgamated Wireless undertook to establish communication for a share of the revenue, and if the venture proved a failure, the departmental expenditure of about £14,000 on land lines and terminal apparatus would be lost. I take the view that if a private company can afford to spend £20,000 to provide services which the country needs, the Government can afford to carry out the work.

81. *To Senator Reid.*—It would be extraordinary if the Government could not raise sufficient capital to

give a service which could be financed by a private company in which the Government had an interest. If the Government's inability to raise the money to provide a submarine cable meant further delay in establishing telephonic communication with Tasmania, I would be inclined to say to the people of that State: "You have been very patient for a long time. You know how desperate is the present position of the Commonwealth. Will you wait a little longer? We shall then give you a service that is worth having."

TUESDAY, 2ND DECEMBER, 1930.

Present:

Mr. GREGORY, in the Chair.

Senator Reid	Mr. Holloway
Senator Sampson	Mr. Long.
Mr. Cameron	

Horace John MacKenna, Commonwealth Works Director, Victoria, sworn and examined.

83. *To Mr. Gregory.*—I am aware of the proposal to establish telephonic communication between the mainland and Tasmania. My department, at the request of the Postal Department, furnished plans for a transmitter building at Cranbourne (Victoria), and Deloraine or Carrick (Tasmania), as well as for receiving stations at Westernport (Victoria), and at Devonport (Tasmania), as well as plans for type of wooden cottages. I submit rough sketch plans for transmitter buildings at Cranbourne and Deloraine estimated to cost £330 and £1,720 respectively. These buildings are to have concrete floors and foundations, with wooden framing, lined with celotex, or a similar material made from Canadian spruce pulp, with tiled roofs as requested. Because of its fire and sound resisting qualities celotex was asked for by the Postal Department, but tests have shown that celotex will smoulder. Other materials, such as fibro-cement sheets, are fire retardant, but not sound absorbent. The plans submitted are for official buildings costing a total of £3,730 for use in connexion with the proposed radio-telephone system. We have not prepared any special plans for buildings to be used in connexion with the proposed submarine cable. As far as I know, we were asked to prepare plans only for buildings to be used in a radio system. The estimates provide for wooden buildings. I should prefer brick, especially in isolated localities where there are no fire-fighting appliances available. The building trade is so depressed that I feel sure that construction in brick would cost very little more than in timber. I consider that the timber building, estimated to cost £830, could be carried out in brick for £880; also that the proposed receiving buildings at Westernport and Devonport, estimated to cost £590, would cost £630 in brick, and that No. 2 transmitting building at Deloraine, estimated to cost £1,720 in timber, would cost £1,820 in brick. I have not the slightest doubt that brick constructions could be carried out for very little more than the original estimates for timber buildings. I believe that the three type cottages, set down to cost £1,150 in timber, could be built in brick for £1,800. If Mr. Crawford has stated that evidence with regard to the buildings had been supplied by the Works Department, I assume that this information was furnished at Canberra. The cottages will have a living room, three bedrooms, a kitchen, bathroom, laundry and conveniences. I do not regard celotex as superior to brick except as a sound absorbent material, but I am not competent to speak of the respective qualities of the two materials from the point of view of a radio engineer. Celotex is much used in certain buildings to prevent echo.

83. *To Mr. Cameron.*—The official buildings, as designed, would not be suitable for a cable-sending station, but the cottages would be suitable for either class of service.

84. *To Senator Reid.*—Celotex is used in America for external walls, but it has to be coated with cement or paint to make it weatherproof. "Tentest," a Canadian material made from spruce pulp, may also be used for external walls if treated in the same way.

85. *To Mr. Gregory.*—It is proposed to install the Kaustine system of sanitation in all the buildings. Properly handled, this system is quite satisfactory. To ensure an adequate water supply, there will be three tanks for each cottage, and one tank for each of the other buildings. Over a period of five years, the maintenance cost for each building will be about £70. If they were constructed in brick, the maintenance charges for the same period would be about £22 for each building. In Victoria, construction work would be done departmentally, but I assume that, in Tasmania, it would be carried out by contract.

86. *To Mr. Cameron.*—We have not done much construction work of this nature during the last few months in Victoria; but, from my general knowledge of the building trade, I feel sure that costs are low at the present time. Many men who, previously, were working for wages, are now tendering for contracts.

The witness withdrew.

George Richard Leggett, Schoolmaster, sworn and examined.

87. *To Mr. Gregory.*—For some time I have been searching the records in the Melbourne Public Library for information concerning the first submarine cable laid to Tasmania, and I thought that it would be of interest to the committee if I furnished it with the details which I have secured. The first submarine cable was laid in 1859. The route followed was from Cape Otway to Victoria Cove, near Cape Wickham, a distance of 56 miles, thence by land to Sea Elephant Bay, on the east coast of King Island. From that point it was laid to West Telegraph Bay, Three Hummock Islands, 60 miles; thence across the island to East Telegraph Bay; thence to West Bay, Circular Head, 28 miles; thence across the peninsula to East Bay, and under water direct to Low Head, a distance of 71 miles. The cable was brought out to Victoria by the SS. *Omeo* on her maiden trip. The contractor was Mr. McNaughton, who chartered the *Omeo*, and brought with him as his adviser Captain Gilmore. H.M. steam sloop *Victoria*, which by the way was our first gunboat, under the command of Captain Norman, had on board Mr. McGowan, Victorian Government Electrician. This vessel was supposed to lead the way and to indicate the route on which the cable was to be laid. Captain McMeikan was in command of the *Omeo*, and Captain Tribe was responsible for the paying-out of the cable. Mr. Butcher was appointed to attend to the instruments, test houses, &c., and Mr. Savage, electrician, to have care of the cable as regards continuity, insulation, &c. Captain Lucas, assisted by Mr. Johnston, was in charge of the landing operations in whaleboats. Mr. McGowan's duty was to supervise and pass the work. Trouble appears to have developed immediately between the commanders of the *Omeo* and *Victoria*, with the result that relations became very strained, and Captain Gilmore seems to have been involved in the dispute. Instead of starting at Cape Otway, as intended, a course was laid for Cape Wickham. The vessels left Port Phillip Heads on Sunday, the 24th July, 1859. The *Omeo* anchored in Victoria Cove, and the soundings showed 10 fathoms forward, sand and shell; 10½ fathoms main rigging, sand and shell; 7 fathoms, rock, at the gangway; and 9½ at the stern. These records indicated a very uneven

bottom. Word was sent to the *Victoria* that Captain Lucas was ready to land the shore end, but Captain Norman considered that there was not sufficient time before dark for this work, so he took his vessel off to an anchorage in Franklands Roads, inside New Year's Island. Captain Lucas, however, proceeded with the work and laid the shore end that evening. Next morning he signalled the *Victoria* to lead the way to Cape Otway, but when Captain Norman learned that the shore end had been laid without waiting for him he was very angry, and Mr. McGowan, who was on the *Victoria*, declared that he would not pass it. At 7 a.m. they got under way for Parker's Cove, Cape Otway, where they arrived at 4 p.m. Captain Norman then complained that the *Omeo* was steering a very erratic course, but Captain McMeikan answered this charge by declaring that he had laid only 36 miles of cable, so his course was a shorter one than that laid by Captain Norman. As the weather was too rough to land the shore end, they remained at anchor until Wednesday. Captain McMeikan then cut the cable, leaving sufficient length for them to land it, and cleared out for Melbourne, in order to find out who was really in charge of the operations and how he stood with regard to insurance on his vessel. He charged Captain Norman with leaving him in a dangerous position in Victoria Cove while he went off to a safe anchorage. When the *Victoria* had landed the shore end at Cape Otway, she went off to Sea Elephant Bay, but failed to find the *Omeo*, which had not yet returned from Melbourne. The *Omeo* was at Sea Elephant Bay on the 30th July, and having connected up the shore end, began to lay the cable towards Three Hummock Islands at 2.30 a.m. on Sunday, the 31st July. After proceeding for about 9 miles the cable fouled the combings and was broken. As all efforts to recover it by grappling failed, it was decided to return to the shore end and to underrun it by means of a whaleboat with fair leads at bow and stern. Mr. McGowan and Captain Tribe, in the *Victoria's* gig, accompanied the whaleboat. The under running was commenced at 10 a.m. on the 1st August. While relieving the whaleboat's crew the boat was upset, but fortunately the crew was saved and the bight of the cable was retained. The end was recovered at 11 p.m., and spliced the following day. On Wednesday, the 3rd August, the *Victoria* anchored ahead of the *Omeo* and passed a line to the other vessel so as to help her to get her anchor without fouling the cable. Unfortunately, the line parted, and when manœuvring the screw of the *Omeo* struck the cable and cut it. After putting a flag buoy down, both vessels had to run for shelter to Three Hummocks Island. The following day was spent landing the shore end at West Telegraph Bay, a difficult task owing to the heavy surf on the beach. Then a start was made back to where the break had occurred, and at midnight on Friday, the 5th August, the vessel anchored. The following morning they recovered the broken cable, which they spliced, and then, as the weather was bad, they had to run for shelter to Three Hummocks Island, where they lay until the 9th August. Proceeding to East Telegraph Bay, they landed the shore end, then laid a course for West Bay, Circular Head, which was reached at 4 p.m. The landing of the cable was completed at 10 p.m., 28 miles having been used from Three Hummocks Island to Circular Head. On the 10th August the *Omeo* anchored in East Bay, and at 4 p.m., after the shore end had been landed, both the *Victoria* and *Omeo* set out for Low Head, which was reached at 6 a.m. the following morning. After the cable had been landed a test as far as Circular Head proved satisfactory. After coaling in Georgetown, the *Victoria* proceeded to Circular Head, which was reached at 6.30 a.m. Mr. McGowan and Mr. McNaughton landed and found everything correct. They then left

for Three Hummocks Island. Finding the land wire right, they left for Sea Elephant Bay, which was reached at 7 p.m. On Friday, the 10th August, they landed at Cape Wickham and found communication perfect to Low Head, but the cable to Cape Otway had broken, and nearly half a mile of it was washed up on the beach. The *Victoria* then proceeded to Cape Otway and on to Melbourne, which was reached at 6.30 p.m. on the 20th August. The *Omeo* having completed her part of the contract, returned from Tamar Heads to Melbourne. The contractor, Mr. McNaughton, had now to repair the broken section between Cape Wickham and Cape Otway, so he chartered the *Stormbird*, a small steamer of 67 tons, under the command of Captain Spence. The *Victoria* and the *Stormbird* left Port Phillip Heads on the 8th September. Arriving at Victoria Cove, they started dragging for the cable on the 9th August, but it was not until the 13th that it was picked up in 15 fathoms. On the 16th a new piece was spliced on, but, unfortunately, when landing it the propeller fouled it and it was again lost. It was recovered and repaired on the 19th September, but when landed and tested it failed to give communication with Cape Otway, thus indicating a break somewhere else. Accordingly the vessel proceeded to Cape Otway, and after under-running it from the shore end, found a fault about three-quarters of a mile out. This was repaired. On the 22nd September the vessels sailed for Cape Wickham, and proceeded thence to Circular Head via Sea Elephant Bay and Three Hummocks Island, testing each station. They left Circular Head on the 27th of September for Georgetown, and proceeded thence to Launceston, where the officers and crew of the *Victoria* were entertained by the mayor on the night of the 1st October. The *Stormbird* had, in the meantime, finished her contract and returned to Melbourne on the 2nd October. Monday, the 3rd October, was proclaimed a public holiday in Tasmania in honour of the successful laying of the cable. The *Victoria* arrived near the bar from Circular Head at 10 o'clock, and to celebrate the successful laying of the cable between Tasmania and the adjoining colonies, Captain Norman fired a salute of 21 guns; but Launceston, although garrisoned with a detachment of nearly 30 soldiers, and under the command of a lieutenant, made no reply. Many people went down to the wharf to inspect the warship, which presented a cheerful sight, decked out from truck to bowsprit and stern-post with the flags of all nations. The other vessels in the harbour also displayed bunting. My information is that the original cable lasted just about long enough to enable the contractor to get his money.

(Taken at Melbourne.)

WEDNESDAY, 7TH JANUARY, 1931.

Present:

(SECTIONAL COMMITTEE.)

Mr. LACEY, Chairman;

Senator Sampson

Mr. Holloway.

William John Cole, Architect, Commonwealth Works Branch, Victoria, sworn and examined.

SS. To the Chairman.—I am aware of the proposal to establish telephone communication between Victoria and Tasmania. I have been in touch with the Postmaster-General's Department to ascertain what buildings will be required if a submarine cable is installed. I have also had a conference with the Director-General of Works in regard to the matter. The proposal is to establish terminal stations at Loree, Victoria, at King Island, and at Stanley, Tasmania. A terminal

station, consisting of a battery room, power room, apparatus room and store room of sizes to meet the requirements set out by the Postmaster-General's engineers, will be built at each of the three mentioned places with the addition of a staff cottage at King Island only. The sketch plan which has been prepared shows the type of terminal station at each of the three places mentioned, and also the type of cottage to be built for the staff at King Island. The Postmaster-General's engineers ask that the terminal buildings be of fire-resisting materials, and that the staff cottage at King Island be of weatherboard. It is therefore proposed to erect the terminal buildings in brick, which will be of permanent construction and cheaper than concrete, and to cover all roofs with terra cotta tiles on account of the proximity of the sea in each case, and the bad effect of sea atmosphere on galvanized iron. The overall size of the terminal building is 51 feet long and 21 feet wide with a height of 12 feet from floor to ceiling, and it is to be constructed as follows:—

External walls—brick, plastered internally.
 Roof—hardwood framing covered with terra cotta tiles.
 Floors—concrete.
 Partitions—hardwood framing with glazing above 4 feet.
 Ceilings—fibro cement.

The estimated cost of these buildings is—

Lorne, Victoria, £840.
 King Island, £1075 (using local stone for concrete).
 Stanley, Tasmania, £840.

The staff cottage at King Island consists of a living room, three bedrooms, kitchen, bathroom, laundry, &c., and is similar in all respects to those erected on the telegraph line between South Australia and Western Australia, and which have been found to be most satisfactory for requirements. The cottage is proposed to be constructed as follows:—

External walls—hardwood framing covered with hardwood weather-board externally and fibrous plaster sheets internally.
 Roof—hardwood framing covered with terra cotta tiles.
 Floors—hardwood joists and bearers on concrete stumps and covered with hardwood flooring.
 Partitions—hardwood framing covered with fibrous plaster sheets.
 Ceilings—hardwood framing and fibrous plaster sheets.

The estimated cost is £1,480. This estimate is based on the previous estimate of £1,150 submitted for a similar building proposed at Western Port in connexion with a radio service between Victoria and Tasmania. If this building were constructed of brick in lieu of weatherboard in order to save maintenance costs, the estimated cost would be £1,680. In regard to the Staff Cottage at King Island, the size of the living room would be 18 feet by 15 feet; front bedroom, 16 feet by 13 feet; second bedroom, 13 feet by 10 feet 6 inches; third bedroom, 13 feet by 10 feet; kitchen, 12 feet by 10 feet; bathroom, 9 feet by 7 feet. That is the whole proposal as put forward by the Postmaster-General's engineers for the three stations. The buildings will be constructed by departmental labour in accordance with the policy laid down by the Commonwealth Government. As far as I know, all our works are carried out by departmental labour. I should say that it would take three or four months, from the time of obtaining approval, to erect these buildings. Of course, at places like Lorne and King Island there will be some difficulty in getting materials there. I am unacquainted with King Island and Stanley, and I am uncertain as to what facilities there are at Lorne in respect of the local fire brigade, and of the means provided to combat outbreaks of fire. At King Island the terminal station will be on the opposite side of the island to Currie. There is probably not much habitation there and fire extinguishers would have to be provided in the building. The water supply would be dependent on catchment from the roof. Because

of that, I submit that the building should be of brick-work. As far as Lorne and King Island are concerned, the bricks for the buildings would have to be obtained from Melbourne. I am not acquainted with Tasmanian conditions, but I should say that the bricks for the building at Stanley would be obtained from Burnie or Devonport. Materials for concrete can be obtained, and there is local stone at King Island. The materials for Lorne would probably be obtained from Geelong, but concrete would cost considerably more than brick-work even using local stone. The estimated cost of concrete construction at King Island is £1,140 as compared with £1,075 for brick construction. In timber construction, the cost of the terminal building at King Island would be £965. I recommend brick construction every time not only for fire protection purposes, but also because of less maintenance costs in the future. Weatherboard buildings deteriorate more quickly and have to be painted at least every five years. It is preferable to paint weatherboards every three or four years.

89. *To Mr. Holloway.*—The buildings at King Island would naturally cost more than those at Lorne. The cost of freight and cartage has to be taken into consideration. I understand that at King Island materials would have to be carted 16 miles from Currie, which is the only port at which they could be landed. We do not have to depend so much upon water supply for protection from fire as we did years ago. Small fires can now be extinguished by the use of fire extinguishers. The buildings at King Island will be provided with fire extinguishers, which will undoubtedly minimize the danger of fire. The water supply would depend on the catchment from the roofs. With regard to concrete construction, the cost of the timber forms is considerable. Brick construction would be cheaper in the long run. There is not a great deal of difference between the cost of timber and that of brick construction. In this case the difference is only £110.

90. *To Senator Sampson.*—At King Island, I recommend a brick building as against weatherboard. It would be a better proposition in every way.

91. *To the Chairman.*—There would be really nothing in the buildings as far as apparatus is concerned that would cause danger from fire. The danger would be from external sources such as grass and scrub fires. I understand that the Postmaster-General's engineers desire that the buildings shall be of brick.

(Taken at Melbourne.)

THURSDAY, 8TH JANUARY, 1931.

Present:

(SECTIONAL COMMITTEE.)

Mr. LACEY, Chairman;

Senator Sampson | Mr. Holloway.

Leonard Stanthorpe Bruce, Tasmanian Government Representative in Victoria, and Manager of the Tasmanian Government Tourist Bureau, Melbourne, sworn and examined.

92. *To the Chairman.*—I have heard of the proposal to connect the telephone system of Tasmania with that of the mainland. I have obtained from the Launceston Marine Board some figures respecting the tourist traffic to Tasmania which may be of interest to the committee. The inward passengers from Melbourne to Launceston for the year ending 30th June, 1929, numbered 29,951, and for the year ending 30th June, 1930, 28,013. The number of passengers, I understand, outwards from Sydney to Hobart was approximately 7,500. I am rather inclined to think that

a large percentage of the tourists to Tasmania would not use the telephone even if such a facility were available. Most of them write telegrams after arrival which consist largely of family messages or intimations as to whether they were sick or not on the voyage. Of course, in cases of urgency, a telephone, if available, would be used. My evidence in this respect can be taken as fairly correct, because for nearly seventeen years I was manager of the Tourist Bureau at Launceston, and came into wide contact with the tourist traffic. Our postal record shows that on the average we send about 396 telegraph messages a year. We would possibly be one of the most considerable users of the telegraph in conveying messages between the mainland and Tasmania. Even if the telephone were available, I do not think that much of our business would be transacted over it. Most of our telegrams from Melbourne to Tasmania consist of requests for information about arrangements for tours extending over the State that must be made outside of the cities. For instance, tourists who wish to visit the Great Lakes or the east coast require accommodation at those places. We telegraph our representative in Tasmania to obtain the necessary information. If it is readily forthcoming, and does not involve extensive inquiry, I receive a reply back within two hours. We send telegrams to Tasmania largely because we require information that must be obtained from sources outside our office. The tourist traffic to King Island is practically negligible. I regret that I have little knowledge of the island. I have never been there, and, therefore, I cannot speak of the possibility of developing the tourist traffic there. Its situation is out of the way, and I do not know that there are any outstanding attractions there. It would be difficult to build a substantial tourist traffic there. The telephone would naturally be appreciated, and would tend to lessen the feeling of isolation among the folk of King Island. I wrote to the Chamber of Commerce at Launceston on the subject of the volume of business transacted between Victoria and the mainland, and I received in reply a few lines stating that they could not supply the information. In addition, I wrote to the Hobart Chamber, and have not yet received any reply. I also saw the secretary of the Chamber of Commerce in Melbourne, and he said that he really could not give me any definite statement. The only figures that I could obtain are those of the Tasmanian Statistician as contained in the *Year-Book*. Those figures show that the total imports to Tasmania from the mainland were valued at £9,225,246, and the total exports to the mainland, £9,763,356. I have no figures in respect of the business transacted at King Island. Possibly Holyman & Sons could supply that information if it were not considered to be a trade secret. Possibly, the business would not be heavy, and would depend largely on the seasons. I expect that fat cattle, pigs, and butter would comprise the bulk of the trade. I do not think that the business would be facilitated to any large extent by the provision of telephone communication with the mainland and Tasmania. It would assist in obviating delays in shipping goods, but that advantage would be costly in that only little use would be made of the facility.

93. *To Senator Sampson.*—I had a fairly long chat with the secretary of the Chamber of Commerce in Melbourne, and he told me that since receiving my letter he had made certain inquiries among business people who had branches in Tasmania, and that he had consequently formed the opinion that they were

quite satisfied that the telegraph facilities were sufficient for their purposes. There is no doubt that if telephone communication were provided it would be largely used by those interested in the large produce trade between the north-west coast of Tasmania and Sydney. Naturally, that business would be conducted on lines different from those applying to the tourist business. A telephone would certainly facilitate the business between the north-west coast, Melbourne and Sydney, but that would not apply so much to the trade from King Island, because the infrequent shipping service would not permit the growers to take immediate advantage of a favorable market in Sydney or Melbourne. I do not think that the bulk of the tourist traffic would take advantage to any great extent of the telephone.

94. *To Mr. Holloway.*—My evidence applies largely to the tourist traffic, which, over the last ten years, has been fairly stationary. There has been a slight decline in the tourist traffic to Hobart, and it has been due largely to the operation of the Navigation Act. The tourists cannot avail themselves of the larger ships that trade with Hobart, and the class of people who would, if permitted, travel by those boats from Sydney to Hobart would be more likely to use the telephone to a much greater extent than the existing class of traffic. A tourist is usually chasing time, and he would probably prefer to send a telegram rather than face the possibility of entering a telephone booth and waiting perhaps three-quarters of an hour before getting a call. He would prefer to send a telegram unless the matter was extremely urgent. When I send a telegram at ordinary rates to Tasmania I usually get a reply within two hours. The reply to an urgent message would be quicker. If a telephone were provided, I am afraid that the increased volume of business done on the Stock Exchange between Launceston, Hobart, and Melbourne in consequence would be scanty. I do not think that the suggestion you make that the business people of Tasmania might be opposed to the telephone because of the likelihood of it bringing more competition from the mainland, would weigh in this matter at all. One sound reason that I can advance for telephone communication is that it would facilitate business between the producers and agents of the State with mainland markets. We are greatly handicapped because of the nature of our transport. Relying on shipping as she has to do places Tasmania, as regards transport, at a disadvantage when compared with the train communications of the mainland. Undoubtedly, a telephone connexion would be availed of by those interested in the fruit trade between Tasmania and Europe.

95. *To the Chairman.*—In making inquiries I always approach the secretary of the Chamber of Commerce in Melbourne. On this occasion he told me that he had had lengthy interviews with several business people in Melbourne, and that they had informed him that as far as they were personally concerned their use of the telephone would be almost nil. It might be of interest to the committee to know that the population of King Island is only 1,200. The island has an excellent telephone system, there being upwards of 150 telephones linking every part of the island. It also has a good wireless station.

96. *To Mr. Holloway.*—King Island has no telephone connexion with Tasmania.

(Taken at Melbourne.)

FRIDAY, 9TH JANUARY, 1931.

Present:

(SECTIONAL COMMITTEE.)

Mr. LACEY, Chairman;
 Senator Sampson | Mr. Holloway.
 Benjamin John Cox, Managing Director, Cox Brothers
 (Australia) Limited, sworn and examined.

97. *To the Chairman.*—I have heard of the proposal to connect the telephone service of Tasmania with that of the mainland. My firm has branches at Hobart and Launceston, and we are in frequent telegraphic communication with them. It is almost a daily communication. Some days we may not telegraph, but other days we may send two or three telegrams. I have not made an estimate of our yearly expenditure on telegrams. Even if the telephone link were established we would still prefer to use the telegraph system because we are very satisfied with it. It is also cheap, economical and efficient. We have never had any cause for complaint. I have not discussed this proposal with any other people. I have discussed it only in our own office with our own secretary. I should think that other firms doing business with Tasmania would hold an opinion similar to mine. Although there is a telephone service between Melbourne and South Australia, I have used it only once in the course of a year, whereas we use the telegraph to South Australia as frequently as we do to Tasmania. I have no idea of the number of firms that do a regular business to Tasmania. There is, of course, a large number consisting principally of wholesalers and warehousemen, such as Paterson Laing and Bruce, which deal with all the retail drapers of the island. Our business is of a nature that would not demand urgency. Our needs are served by the telegraph system. We have no business relations with King Island. I fully realize that a telephone service to Tasmania would bring the subscribers on the island into touch with those on the mainland, and also with the rest of the world. From a general point of view, Tasmania is entitled to telephone facilities in common with the rest of Australia. In view of the present financial position I do not consider that the establishment of this telephone service would be a reasonable business undertaking, even though it might show a return covering interest and sinking fund payments and a substantial profit after the ninth year of operation. My only reason for objecting to the telephone service is the existing financial depression.

98. *To Mr. Holloway.*—I agree that a conversation by telephone is an advantage that cannot be obtained by telegraph. It has often happened that we have had to wire two or three times before we could finalize a particular matter, but it is only on rare occasions that we had to speed up replies to our telegrams. We seldom send urgent telegrams. I pay a compliment to the Postal Department for the efficiency of the telegraph service. It is a wonderful system. I have had a wide experience of its operation and few errors are made. We can rely upon getting replies to our telegrams and upon getting attention from the department. I take it that a telephone service, if established, would be more freely used in prosperous times. I am still of the opinion that this is not the right time to install the system. At this stage the money could be used for a better purpose. We have been a long while without telephone connexion between Tasmania and the mainland, and there is no great urgency for it now. Sooner or later the whole of the capital cities of Australia must be linked up, but when that comes about our firm will not contribute much to the revenue from the service. Only in case of extreme urgency would we use the telephone. Of course people might use it for sentimental reasons. It might be convenient to those con-

cerned with the stock exchange operations and the fluctuations of prices, but that would not apply to our business. Perhaps I may be a little over-cautious in saying that this is not the right time to establish a telephone link with Tasmania, but it must be understood that when we are short of money we are naturally bound to tighten up our expenditure.

99. *To Senator Sampson.*—The establishment of a telephone service to Tasmania would make little or no difference to the trade in our own line of business. Our branches in Tasmania would not be likely to order direct from Melbourne warehouses, but I can quite understand that some firms in Hobart would, if a telephone were available, ring up Melbourne in order to procure certain goods. The people engaged in the produce trade on the north-west coast of Tasmania would undoubtedly use the telephone in order to communicate with Sydney. A firm in Hobart, Burnie or Devonport might ask Sydney for a quote and it might depend upon the immediate despatch of the reply as to whether an order would be placed. In that case a telephone conversation costing 5s. or 6s. would not be out of the way, but an occasion such as that would be so rare that it would be the exception rather than the rule. I can quite understand that telephone connexion would eventually benefit Tasmania greatly by bringing the big mining interests and the Electrolytic Zinc Works into closer touch with the mainland, particularly in respect of stock exchange operations affecting items perhaps running into tens of thousands of pounds. That does not apply to our business. I should say that tourists would be likely to use the telephone to communicate with their friends and business associates on the mainland.

(Taken at Melbourne.)

SATURDAY, 10TH JANUARY, 1931.

Present:

(SECTIONAL COMMITTEE.)

Mr. LACEY, Chairman;
 Senator Sampson | Mr. Holloway.
 Sydney Herbert Witt, supervising engineer in charge of
 research, and radio engineer, Postmaster-
 General's Department, sworn and examined.

100. *To the Chairman.*—I am aware of the proposal to connect the telephone system of Tasmania with that of the mainland. I was asked by the department to prepare a report as to the possibility of working this system by radio channel. The proposal that I made was for a short wave radio telephone system, making use of the latest developments in the art of radio, of sufficient power to provide a commercial telephone circuit between Tasmania and the mainland which would for perhaps twelve or eighteen hours a day give a service, subject to some fading, but otherwise like that of wire circuits. The cost of that service has already been given to the committee. The type of equipment proposed to be used consisted of directional aerials, with radio frequency energy concentrated in the direction of a receiving station at Tasmania. There would be one sending station in Victoria; and a corresponding receiving station in Tasmania; a sending station in Tasmania and a corresponding receiving station in Victoria. The whole scheme would be combined as one complete two-way channel equivalent to a telephone line by means of terminal apparatus to be installed at Melbourne central exchange and at the Launceston central exchange; the net result being that the radio link would be connected at each end—

Melbourne and Launceston—with network of lines in Tasmania and the mainland, thus enabling the subscribers to use the ordinary telephone, and speak one with another. I have not seen the evidence of Mr. Fisk in detail, but I know something of its nature. I believe that one of the outstanding points of his evidence was that the radio service was a more modern development than the cable service. Actually the most modern development in communication over long sea distances is by cable. A radio link of any kind over long distances is subject to variations that are purely natural and beyond the power of man to control, since the radio energy must be sent to a high level of the atmosphere in order to come down where desired. The non-uniform ionization of the upper atmosphere, and the consequent variable refraction of the rays, lead to irregularity of propagation which is observed as fading. It is just as much beyond the power of man to alter that as it is for him to alter the distribution of visible clouds, but man has been able, by continual study and experiment, to maintain communication over various periods of the day by selecting different frequencies (wave lengths) for a sending station and by the use of automatic volume regulators at the receiving station. Despite that, any radio link is subject to variations, and there are times when it cannot be used. It does not matter what is the power of the sending station—it may be hundreds or thousands of kilowatts—there will be times when the receiving station will be unable to receive because of a local thunderstorm. The electrical power that can be released by a local thunderstorm at a receiving station is so enormous that we cannot hope to provide a distant transmitter with sufficient power to override it. On the other hand, communication by means of wires and cables is relatively free from those disturbances. Wires and cables can be interrupted by actual mechanical damage, but such happenings are much less frequent than electrical disturbances to radio, which occur particularly in the summer time. Until recently, the longest cable was between Florida and Cuba—a distance of 100 miles—whereas the shortest distance between Tasmania and the mainland is 153 miles. Recent developments have made it practicable to construct a submarine telephone cable between Victoria and Tasmania, and that is why it is now made part of this proposal. The point at issue was the modern developments in radio and cable. I do not think that it would be fair to say that one system is more up to date or more technically meritorious than the other. For certain kinds of service, the cable is likely to be greatly developed in the future. The apparatus with which we proposed to connect the radio with the land lines is termed a voice-frequency terminal. Its function is to combine the two uni-directional channels of the radio link with the single bi-directional channels which obtain on telephone lines. Without such terminal apparatus, the radio system could not function as a link to connect up regular telephone trunk lines on either side of Bass Strait. It not only provides a means of connexion, but at the same time so controls the voice energy flowing from the line that the radio transmitters are fully modulated which is the most favorable condition for receiving. The terminal apparatus also contains some ingenious voice-operated devices, without which the hours of service per day would be greatly curtailed. The cost of each set of terminal apparatus is in the region of £2,500. I do not agree with Mr. Fisk's suggestion that the radio service to Tasmania would be capable of carrying 100 calls a day. It would not carry more than 50 calls a day. The Atlantic radio service conveys about 50 calls a day per channel. We have made experiments to ascertain what continuity of service

could be maintained with Tasmania, and those experiments are still being continued. It is necessary to conduct them over a long period in order to gain data in respect of the change of seasons. A commercial service could be maintained by radio for twelve hours or possibly eighteen hours of the 24 hours of the day. We could not rely upon more than eighteen hours of service. One radio channel would not be capable of coping with the traffic that would be offering now. We have made a careful study of the traffic figures, and we estimate that one radio channel, even at the outset, would be overloaded, and there would, consequently, be delays to traffic. To cope adequately with the traffic, there would have to be two channels available immediately, and possibly in a few years time we could load up five channels. Estimates of the traffic have been prepared for periods of five and ten years. I do not consider that a radio telephone to Tasmania could be made a payable proposition at ordinary telephone rates. The rates would have to be five or six times as high as the ordinary trunk line rates which are proposed for Tasmania.

101. *To Senator Sampson.*—The radio service would operate from twelve to eighteen hours of the 24 hours a day, and 50 calls would be the limit per day. That estimate was made not by me, but by Mr. Fanning. It is based on the result of our experience in working telephone traffic throughout the Commonwealth and over the radio link with London. At the same time we have at our disposal information from the British Post Office in respect of the traffic between England and America on the existing radio telephone links. That is information on which we can rely in framing our estimates. During some hours more than four calls an hour would be possible, but during other hours communication could not be established at all, particularly during thunderstorms. That is our actual experience. Because of distant thunderstorms or disturbance of the sun's radiation, the working of the Anglo-Australian service is so poor that only technical operators at each end can maintain communication, the level of energy passing over the system being not good enough to extend to subscribers. Taking all those facts into consideration we cannot expect to carry more than 50 calls a day on a radio link. That means that the subscribers might have to wait hours for calls and the delays would be detrimental to business. Our experience is that a subscriber waits about for a while and then, possibly, because of a business appointment goes off in a hurry without letting the operator know. The call comes through, communication is established with the other end, and we find that the person who has made the call is out. That reduces the average of calls tremendously. Sometimes when we think that everything is all right, the circuit goes uncommercial for a period, as has happened in the case of the New Zealand and London link. If the radio link were established between Tasmania and the mainland and business increased in consequence, we would have to establish a complete duplication of the plant for every additional channel. A submarine cable would take five channels which could be open for business during the 24 hours of the day. Our experience of the existing Tasmanian telegraph cables is that the average frequency of interruption is one in seven years. I believe that the telephone link between Tasmania and the mainland would be availed of immediately. When I have been in Tasmania the commercial people there have said that if they only had telephone communication they would do considerably more business. They contend that at present the mainland merchants have a big advantage over them. I notice in the newspapers that the Chamber of Commerce and other bodies are not very enthusiastic about this proposal, so evidently there is a conflict of opinion about it.

The same thing happened in Western Australia. At one period the Chamber of Commerce at Perth said that there was no need for telephone connexion with the eastern States, but since a channel has been put in the public is enthusiastic about the project. We are now getting a lot of business on that channel and, of course, the community of interests between Tasmania and Victoria, and even New South Wales, is much greater than it is between Western Australia and the eastern States. I hope that I shall not offend Tasmanian sentiment by saying that the Tasmanians think a good deal in terms of Victoria. They listen to Victorian broadcasting programmes and are familiar with the local conditions of that State to a greater extent than the New South Wales people. I have been interested in long distance communication ever since we started in 1925 on a campaign of efficient communication throughout the Commonwealth. I have examined estimates prepared by the Traffic Department and I cannot recall one case in which the initial estimate of traffic on trunk lines has not been exceeded. Let me give an instance. I was keen to get a carrier system instituted between Melbourne and Mildura because there was no direct service at the time. Inquiries were made and deputations took place. The net result was that a grave doubt existed among all of us whether, on the facts, the line would pay. After a while it looked as if a line might pay, but we could not see two channels in sight for a long time. We put the carrier system in. Within a month the channel was fully loaded, and within a few months the people were crying out for further facilities because delays were banking up. We are now contemplating putting in three channels. Exactly the same thing happened on the Brisbane service. In that case it was expected that the traffic would just about fill the channel, but we had not opened the channel a week before it was fully loaded, and soon we had to put in three channels. My general experience is that when we put in main channels on a trunk line system they are immediately availed of, and our traffic estimates are exceeded. I have no doubt that our estimates in this case will be easily realized.

102. *To Mr. Holloway.*—I have no hesitation in recommending the submarine cable as against radio. With all channels, irrespective of whether they be radio or wires, delays to business will occur because of the exigencies of traffic in busy hours. On all our channels throughout the Commonwealth we have to provide for a greater capacity than would be necessary if the traffic were uniform. The traffic is similar to that on railways and tramways, which is subject to peak and slack periods. We estimate on the basis of our calculations that five channels will be fully occupied in ten years, and that after that an additional cable will be necessary. It is an expensive job, but it must not be forgotten that the cable will eventually pay its way. With a radio service King Island would be cut out altogether unless the plant were duplicated. In that case the cost of the scheme would be doubled and there would still be only one channel between Victoria and Tasmania. It is quite possible that the development of the submarine cable may be rapid in the next few years. Up to recently it was thought that we had reached the limit of the possibilities of the cable, but there is now no reason why it should not be possible to have a submarine telephone cable 1,800 miles long. Since 1915 it has been possible to send a voice over the radio, but the combination of two radio channels into one complete bi-directional channel to connect up the telephone networks of subscribers in different countries is a recent telephone development. The electrical communication engineer to-day must not confine himself to any one system of communication. All forms of electrical communication depend upon the propagation of electric waves. Irrespective of

whether the waves are guided by wires or are projected into space, the basic phenomena are the same. As between systems employing wires and systems not using wires (radio) the choice in a given case is chiefly one of economy and reliability of service. A communication engineer should possess a sufficiently broad knowledge to weigh impartially the merits of the several systems now available for a particular service. With radio communication it is possible to send electrical waves out in any given direction. They can be projected as a beam into space, but their subsequent pathway around the curvature of the earth is uncontrollable. With wire communication, whether by cable or by wire on poles, the electrical wave is definitely directed along the whole of its pathway. Let me give an illustration. If it is desired to send water from a windmill to a tank, say, 100 yards away, it can be done in two ways. First, by putting in a force pump and nozzle at the windmill, the water can be shot through the air on to the distant tank. Secondly, the water can be run through a pipe direct to the tank. In the one case the water is subject to various hazards, which may cause much of it to miss the tank; in the other it is controlled throughout its journey. With wires, communication can be definitely directed, but with radio communication if the conditions alter in the air, the energy will not come down exactly as expected. By changing the wave length at various times throughout the day, the hours of useful communication can be extended. Unfortunately, the number of wave lengths available for any given service is limited. We have allowed for three wave lengths in the Tasmanian service. They are as follows:—

In one direction 51.7 metres, and in the other 51.2 metres.

In one direction 80.1 metres, and in the other, 80 metres.

In one direction 108.3 metres, and in the other, 106.4 metres.

That will give us three wave lengths in each direction for use at different times of the day. We are hoping to get along with only two of them. These wave lengths are allotted on an international basis. In the daylight the shorter wave lengths have superior carrying powers, in the late afternoon medium wave lengths; at night time, the longer waves are preferable. For very long distance radio communication we would use wave lengths of something like 15, 25 and 30 metres instead of 51, 80 and 108, as proposed for working over the relatively short distance of the Tasmanian service. The selection of wave lengths for short wave systems is made from the results of theoretical study and long experiments. Thousands of records have been made and analysed. That work has been going on for several years. The information is available to us and it is on the basis of those studies that we have chosen the wave lengths mentioned. Radio is part of my work and, naturally, I am keen and enthusiastic about it.

(Taken at Launceston.)

TUESDAY, 13TH JANUARY, 1931.

Present:

(SECTIONAL COMMITTEE.)

MR. LACEY, Chairman;

Senator Sampson | Mr. Holloway.

William Robert Peel Salisbury, Secretary of the Launceston 50,000 League, sworn and examined.

103. *To the Chairman.*—The proposal to connect the telephone system of Tasmania with that of the mainland has been discussed by my executive. As far as I can learn, the people of Tasmania, as a whole, are anxious to have this telephone link. I have heard no one oppose the proposal. The majority of the

business people in Tasmania do business with Victoria. Many of them do business with New South Wales. I am decidedly of the opinion that if telephone facilities were provided they would be largely availed of by the business community. The tourists would also make use of the service. It would be a great convenience to business men of the mainland who are visiting Tasmania, to be able to keep in touch by telephone with their businesses. For sentimental reasons alone, tourists would freely use the telephone service. I have had many complaints about the lack of telephone facilities with the mainland. Yesterday, one business man here told me that if a telephone were established he would probably speak daily to Victoria, because it would enable him to get into personal contact with firms with which he was dealing. I have not visited King Island, but I have some knowledge of it. There is not a great deal of business done between King Island and Northern Tasmania. The establishment of a telephone via King Island would assist in developing its primary industries and its potential resources. At present, the residents of the island are cut off from Tasmania and Victoria. They are isolated. I believe that a telephone link with the island would, to some extent, relieve that isolation and increase the business transacted with Tasmania. I fully realize that a submarine cable with Tasmania would bring the telephone subscribers here in touch with the subscribers on the mainland and also enable communication to be established with England and elsewhere abroad. I say, most decidedly, that Tasmania is entitled to this facility in common with the rest of Australia. My league is most emphatic on that point. If this work can be shown to return interest and sinking fund payments and a substantial profit after the ninth year of operation, I consider it a business proposition. Whether by means of cable or radio, telephone connexion should be established between Tasmania and the mainland. Despite the depression existing throughout Australia, this work should be proceeded with to enable the people of Tasmania to be placed on a footing equal to that of the people of the other States. I have been 50 years in Launceston, and for the last two years I have been secretary of the league. Up to two years ago, I was in business as a manufacturing engineer. I cannot say that there has been anything like an agitation for telephone connexion, but I have heard it mentioned from time to time during the last two years that Tasmania is rightly entitled to this facility. We recognize that this State is in an isolated position, and that every opportunity should be given it to be placed on equal footing with the mainland. We are part and parcel of the Commonwealth, and we should have every facility for trade, including telephone connexion and a frequent and regular shipping service.

104. *To Senator Sampson.*—About 90 per cent. of the work of my firm was mining engineering, and the telephone would have been of tremendous advantage to me particularly in respect of breakdowns necessitating immediate repairs to machinery. We received telegrams practically every week, and had we been able to speak directly to the firms concerned, it would have made a great difference to us. Telephone connexion with the mainland would have been a great boon in the past.

105. *To Mr. Holloway.*—At the beginning of federation, the idea was that the isolation of Tasmania would be removed to a considerable extent, but despite our repeated protests and agitation little or nothing has been done in that direction. The absence of telephone connexion with the mainland has been one of our complaints. A considerable amount of produce is sent from Tasmania to Melbourne and Sydney. A telephone connexion would be of immense value in assisting

that business, and also in ascertaining the activities of the stock exchange in respect of fluctuations of prices. That applies particularly to the north-west coast. It often happens that when the price of potatoes increases in the Sydney market, the growers on the north-west coast of Tasmania, because of not receiving advice soon enough, are unable to take advantage of the increase. With a telephone service to the mainland, they would be placed on a footing equal to that of the producers on the mainland. It often happens that two or three telegrams have to be despatched to the mainland before a certain matter can be finalized. That loss of time and money would be obviated were telephone facilities available. I favour a radio service as against a service by submarine cable. I believe that cables will ultimately become obsolete. It is my opinion that the Tasmanian people would accept a radio service even with restricted hours of operation in preference to a submarine cable service. Of course, if the radio system, once it were instituted, could not cope with the traffic, a cable service could be instituted later. The general opinion in Tasmania is that telephone connexion with the mainland is essential, and I do not think many business people in Tasmania are opposed to the proposal.

The witness withdrew.

David Sydney Jackson, lock manufacturer, Launceston, sworn and examined.

106. *To the Chairman.*—I have heard the evidence of the previous witness and, to a great extent, I agree with it. Our business is done mostly with Melbourne and Sydney. During the last few years I have fully realized that a telephone link with the mainland would be of great benefit to Tasmania. I have lived in Launceston 41 years. Speaking as one who has had something to do with the public interests in Launceston, I can say that there has been a desire on the part of the people to be linked up with the mainland in the same way as the people of the other States are linked together by telephone. I do not expect that the same ratio of business as on the mainland will be done on the line, but there is a feeling here that Tasmania is more or less a Cinderella, as far as the Commonwealth is concerned. The other States are linked up by train services. They have, in addition, daily mails. Our last mail left here on Saturday last, and we shall not have a mail arriving here until to-morrow (Wednesday). For a number of years, in the winter time especially, we have had what some of us consider to be an appalling mail service, and it is only natural that we should welcome a telephone service. I do not care to express an opinion whether the connexion should be made by radio or cable. I am quite satisfied to leave that to expert opinion. The question of linking King Island by telephone has cropped up. The main islands, so far as Tasmania is concerned, are those of the Furneaux group, of which Flinders Island is one. I have not visited King Island, and have not the knowledge of its potentialities that I have of those of Flinders Island. Both islands are small. If a cable is to be run in the direction of King Island, its residents should be given the advantage of telephone connexion, even if it costs a little more. I do not know whether there is any proposal to run a cable via Flinders Island, but as each island now has a wireless station, I do not know whether they would be greatly handicapped if a radio service was considered to be the more desirable proposal. More trade is done at King Island than at Flinders Island, but King Island does most of its business with Melbourne. A lot of Melbourne capital has been put into that island, and, of course, trade follows its interests. The north of Tasmania does not

do the amount of business with King Island that it really should. A restricted radio-telephone service would be better than no service at all, but if a cable service is more reliable, the people of Tasmania would prefer it. The position has not been put fully to us. We do not even know the relative costs of the two proposals. Because we have no telephone connexion with the mainland, we do most of our business by telegram. If we miss the mail we can telegraph to Melbourne and have goods brought back on the next ship. For instance, I sent to Melbourne for goods on Saturday last. The letter was not delivered until yesterday morning (Tuesday), yet the goods were delivered in our shop this morning at ten o'clock. There are, of course, times when we would prefer to transact business by telephone, even if the cost were three or four times that of a telegram.

107. *To Mr. Holloway.*—We want the best telephone service that can be obtained for the money to be expended. I know nothing of the relative merits of radio or submarine cable. I would be guided entirely by expert advice on the subject, but I do say, as a citizen of Tasmania, and one likely to use the telephone, perhaps not often, to get into touch with our agents in Sydney and Adelaide, that the cable may not justify itself immediately, but that, in any case, we are entitled to the same consideration as the people of the other States. The absence of telephone communication is militating against the progress of Tasmania. The people of this State, like the people of the other States, will develop a taste for the interstate telephone. A telegram usually necessitates a reply, and, in that case, there would be two costs. It would be possible for a firm here to arrange with a firm on the mainland to share the cost of telephoning, seeing that they now bear the cost of telegraphing to one another. The Tasmanian business man, because of the absence of telephone connexion, is at a distinct disadvantage compared with the business man on the mainland. The irregular and infrequent transport service is an added disadvantage.

The witness withdrew.

Thomas Henry Davies, Member of Parliament, Tasmania, sworn and examined.

108. *To the Chairman.*—I am a grazier and a retired officer of the Imperial Army. I desire to give evidence in the direction of linking Flinders Island with the proposed telephone link between Tasmania and the mainland. I am representing the Flinders Island municipality. The island itself comes within my constituency. Telephone connexion via Flinders Island would keep the producers there in constant touch with the markets on the mainland and in Tasmania. Of course, the same thing applies to King Island, but Flinders Island has a greater population. There is a wireless station at Emita, on Flinders Island, and radio messages can be sent from there. I do not know whether the trade of Flinders Island with Tasmania is greater than that of King Island. The Furneaux group of islands is situated 90 miles from Victoria, and 40 miles from Tasmania in the track of the Hobart, New Zealand, Melbourne steamers. The total area of the whole group is 600,000 acres, and that of Flinders Island, 521,000 acres. The annual rateable value of the property is £10,431, there being 205 settlers. Land held under freehold is about 250,000 acres. There are four post offices and 29 telephone subscribers, as well as a wireless station at Emita. The population is approximately 1,000, including the half-castes on the Cape Barren Reserve. There

are 1,290 acres under cultivation, but grazing takes place over about 300,000 acres. The exports are as follows:—

Butter, 60 tons.
Fat cattle, 1,200.
Sheep, 6,000.
Wool, 550 bales.
Furred skins valued about £3,000.
Mutton birds valued about £75,000.

The total area of the island is 521,000 acres, the total land under crop being 1,290 acres, consisting of:—

	Acres.
White Oats	5
Algerian oats	40
Pears	3
Potatoes	5
Green fodder	563
Oaten hay	271
Other hay	402
Orchard	1
	1,290

Flinders Island is about 50 miles long, and is undulating volcanic country consisting of chocolate, black and sandy soils which contain a certain amount of phosphates and up to 2½ per cent. of lime. Roughly, it costs £4 per acre to clear the land. The rainfall per year is from 25 to 30 inches, and artesian water is found 6 to 20 feet deep. There are practically no frosts or diseases on the island. It is 10 to 20 degrees milder than either Tasmania or Australia. The height of the agricultural country is from 10 to 500 feet above sea-level. There are 32 smaller islands practically all used for grazing purposes. The three ports at present being used are Whitemark, Emita, and Lady Barron. The present communication is inadequate, being by boat, usually by fortnightly service. The most important point is that the producers are absolutely isolated. Although the wireless is of great assistance, a telephone communication would bring all the settlers into close touch with the mainland of Tasmania and Victorian markets. This is absolutely essential for the welfare of the islanders, so that they may obtain the latest information from markets for their stock export, and it is claimed that by telephone communication business could be transacted more expeditiously and privately. If the island is to develop, it is quite certain that more consideration must be given to communications with this valuable municipality.

The telephone offices at Flinders Island are as follows:—

Offices.	Number of Subscribers.
Blue Rocks	2
Emita	6
Emita (wireless)	Nil
Lady Barron	1
Laccoota	Nil
Lughrata	1
Ranga	8
Palana	3
Leeka	Nil
Whitemark	8

Flinders Island has greater potentialities for development than King Island, because the climate is milder and the soil is perhaps a little better. It contains more phosphates, and on account of the geological structure of the island also contains a certain amount of potash and soda which comes from the felspar, of which the country is made up. Frosts on the island are unknown. I am a firm advocate of the proposal to link Tasmania with the mainland by telephone, although I favour the route via Flinders Island. The mutton bird industry is well established there. Recently the residents have started to tin crayfish for export. They are also doing something in the same way with mutton birds in competition with Java chicken. A telephone link with Tasmania and the mainland would

be very useful in developing those industries. It would also enable the producer of fat stock to keep in constant touch with the markets both in Tasmania and on the mainland. I understand that just off the north end of Flinders Island, around the Three Sisters and towards Babel and Chappell Islands, there is an inexhaustible supply of fish, more particularly crayfish. I know that there is an enormous supply of fish around the Furneaux Group. Tasmania is long overdue for telephone connexion with the mainland. If this facility were established, it would be freely availed of, and would add greatly to the trading operations. It would make for fairer competition and provide a better market for the producers. I have not studied the position of the sea bottom on the route via Flinders Island, but at present a cable runs from Georgetown to the mainland. I suggest that if the telephone route is not taken via Flinders Island this committee might consider the advisability of linking the island with the existing cable so as to give telegraphic facilities to the residents. I understand that a recent invention enables a telegraph cable to be used for telephonic purposes, but, of course, it has no commercial value at present. It is essential that Tasmania should be linked by telephone with the other States, and in doing that some consideration should be given to the isolation of the islands upon which we rely so much for early fat stock and other primary produce. The people of Tasmania have been agitating for some time for telephone connexion. They are feeling the need of it, and they are anticipating its establishment.

The witness withdrew.

(Taken at Launceston.)

WEDNESDAY, 14TH JANUARY, 1931.

Present:

(SECTIONAL COMMITTEE.)

MR. LACEY, Chairman;

Senator Sampson | Mr. Holloway.

Frank Herbert Stephens, merchant, Launceston,
sworn and examined.

109. *To the Chairman.*—My firm are shipping and forwarding agents and customs agents. I am representing the Chamber of Commerce. I am aware of the proposal to link Tasmania with the mainland by telephone. This subject has been discussed by the Launceston Chamber of Commerce, and I am authorized to express its opinion. There is a general desire on the part of the business community at Launceston to have telephone connexion with the mainland. The opinion of the Chamber of Commerce is that this is very necessary. We are to a certain extent isolated, and telephone connexion would bring us close to the mainland and with Melbourne particularly, because most of the merchants in Launceston do business with Melbourne. A telephone service would, therefore, be of great assistance to them. Telephone facilities would undoubtedly be freely availed of by business people and the residents of Tasmania generally. I have a business in Hobart and in Melbourne, and a telephone connexion would be very useful, indeed, to me. I would not say that the departmental estimate of 114 calls per day during the first year of operation is excessive. If the charge is reasonable, persons who want goods in a hurry will certainly use the telephone in preference to sending telegrams. Of course, the better and cheaper the facility is, the more it will be used. Tasmania is a small place, and the people should be given every facility for trading. A letter can be sent from Melbourne to Sydney every day, but a daily mail from Tasmania to the mainland is at

present impossible. The establishment of a telephone link with the mainland would give Tasmania a wonderful opportunity to improve its trade, and particularly the tourist traffic. This State should be the tourist resort of Australia, and with a telephone link and a daily shipping service, a rapid development would take place. Frequently in the past it would have been of great advantage to my firm to be able to make use of a telephone connexion with the mainland, and I suppose that other firms have had the same experience. I realize that a telephone connexion with the mainland would bring the subscribers here into touch with those on the mainland, and also enable them to telephone to England and elsewhere abroad. I do business with London, and it would be a great advantage to me to be able to communicate with that city. Tasmania is more entitled to facilities such as this than is any other part of Australia, particularly in view of its isolation. We should be given every advantage to keep us linked with the mainland. If it can be shown that this work will return interest and sinking fund payments, and show a substantial profit after the ninth year of operation, I certainly consider it a reasonable business proposition. A telephone service should be installed in spite of the existing depression throughout Australia. I have a little knowledge of King Island. It is a fine place for grazing and fattening stock, but owing to the poor prices that the residents have been obtaining lately for their products, I am inclined to think that the island trade is not so very important. I cannot see in what way telephone connexion would help the island. It is a very small place. I know from my experience of King Island trade that the number of its stock has not increased during the last few years to the extent anticipated. I certainly think that King Island is entitled to a telephone connexion, but it is really a question of cost. Little telephone revenue would be obtained from the island. If it is of advantage to break the cable at King Island, I say by all means link the island with Tasmania and the mainland. Not much trade is done between the island and Launceston. I was for a number of years agent for the Tasmanian Shipping Company, and I handled that company's vessels trading with the island. I, of course, know something of the trade, and it certainly has gone back. The cost of getting store cattle to the island is excessive. It is the custom to buy store cattle here and ship them to King Island for fattening. Unless the land is very cheap that is an expensive method of fattening stock, because the cost of transport and handling precludes any possibility of profit. Then, again, even if the market is good the producers cannot always get their cattle shipped in time to take advantage of high prices. The shipping facilities to and from the island are poor. I am aware that there are two proposals before the committee, one a radio service and the other a submarine cable service. A radio service which would be unreliable at times would be of little use to Tasmania. It would be unsatisfactory, and tend to lessen the popularity of telephoning to Melbourne. Of course, with the advance of science, one never knows what may develop in regard to radio. If there were a possibility of a continuous service by radio without interference it would undoubtedly be the better service; but, of course, that cannot be guaranteed at the present time. Then, again, the question of secrecy has to be taken into consideration. There must be secrecy in respect of telephone messages. It would be ridiculous for me to ring up my office in Melbourne if my competitors could hear what I have to say.

110. *To Senator Sampson.*—In my own business I use the trunk line a good deal between Launceston and Hobart. I would undoubtedly use a telephone connexion with Melbourne and Sydney. We do a lot of shipping for farmers, and we are anxious to get the

best market prices. It would be of great assistance to us if we could ring Sydney and ascertain the state of the market. I am confident that if this facility were established it would be freely availed of.

111. *To Mr. Holloway.*—If telephone connexion is established trade will naturally increase. Because of the infrequency of mails to Tasmania and the irregularity of transport generally, Tasmania is entitled to telephone connexion with the mainland. Even if our transport facilities were increased, the tendency would be to enlarge the business carried out over the telephone. In addition, the domestic and social life of the community would be greatly assisted by a telephone service. People who have relatives on the mainland would certainly seize the opportunity to converse with them. Tasmania is the most wonderful tourist resort in the world. I recently had a trip to Norway, Sweden, and other parts of the world, and I have seen no place like Tasmania. It should be much more of a tourist resort than it actually is. We have not yet started to cater for that traffic. Telephone connexion would undoubtedly assist the tourist traffic. If a radio service would be unreliable, and operates only twelve or eighteen hours of the day, I would prefer a submarine cable provided that it is dependable. It would be just as well to make a proper job at the start. If we are to develop Tasmania properly we must have a continuous telephone service. Telephone connexion with the mainland is considerably overdue.

The witness withdrew.

James William Southon, director and secretary of a drapery establishment in Launceston, and member of the Chamber of Commerce and retail section of the executive, sworn and examined.

112. *To the Chairman.*—I am aware of the proposal to link the telephone system of Tasmania with that of the mainland. I have listened to the evidence of Mr. Stephens, and I agree with him, except in respect of his statement that this work should be proceeded with despite the financial depression. I suggest that as our finances are in such a bad way we should be careful of what expenditure we undertake. This proposal should be investigated carefully to ascertain whether it is urgently required before we embark upon any expenditure in connexion with it. The Chamber of Commerce is in favour of this proposal, and its members will use the telephone when it is available. We consider that we should be at no disadvantage compared with the mainland in respect of telephone connexion. We do a great deal of business with Melbourne, and, if this facility were established, we should certainly use it. If the rates were not excessive, I consider that the telephone would be used more than the telegraph, because more can be said in a three-minute conversation than can be conveyed in an expensive telegram. We do a lot of business with Melbourne, and at present when orders are sent for goods, it sometimes happens that the goods when they arrive are found to be unsuitable and have to be returned. That unnecessary cost would be prevented if we were able to give the order by telephone. I am afraid that our firm would use the telephone rather too much, and a check would have to be placed upon its use. Heads of departments would be only too glad to ring up Melbourne for the purpose of ordering goods. I have no doubt that the telephone would be readily availed of. I know of King Island, but only in a business way. It is a small island, and does not do much business with Launceston. If the submarine cable is taken via King Island, I certainly think that the residents would have the use of it. A telephone service can be likened to a tramway service, because if a tramway is run into the

bush, houses spring up in the vicinity of the line, and the tramway soon becomes a paying proposition. It brings about a development that would not otherwise take place. I am certain that the number of calls per day would exceed the departmental estimate of 114. Quite 50 calls a day would be made from Launceston alone. It invariably happens that telephone traffic increases once the service is installed. There has been an agitation for this facility in Tasmania for some years. I favour the cable service as against a radio service. I consider that the cable service is the only one that would give us satisfaction. It would be useless to establish connexion with some one on the mainland and to have the conversation interrupted because of weather conditions. We want a continuous and dependable service.

113. *To Mr. Holloway.*—Even if Tasmania's difficulties in respect of isolation were to a great extent overcome by the provision of better transport facilities and a daily mail service, telephone connexion with the mainland would still be a necessity. Of course, if this telephone connexion were established, even in this time of depression, it would assist business generally. The work has to be paid for, and when there is nothing in the Treasury it will be difficult to find the necessary money.

The witness withdrew.

Leonard Thomas Pybus, manager of the Launceston branch of the Tasmanian Tourist Bureau, sworn and examined.

114. *To the Chairman.*—I am aware of the proposal to connect the telephone system of Tasmania with that of the mainland, although I have not heard the details. It is impossible to give the exact figures of the tourist traffic between Launceston and Victoria. There are supposed to be 30,000 people from Victoria arriving in Tasmania each year, and I take it that about half of that number would be tourists. Of course, they would not all be Victorians, as quite a lot of them come from the other States. People coming from Victoria probably leave their own people the day before, and it is only natural that they would want to let their people know that they had arrived safely. At present they can do that by sending a telegraph costing 1s. 4d., or they can go into the Tourist Bureau and write a letter costing 2d. That letter would return by the steamer by which the tourists arrived, and their people in Victoria would get it the next morning. In addition, the tourists are able to send lettergrams in the evening, which are cheaper than telegrams. It is problematical whether the tourists would use a telephone connexion with Tasmania, particularly if it is more expensive than letters or telegrams. We do not have very much telegraph communication with Victoria. The only telegrams that we receive are from people requiring us to make reservations for them. Usually the tourists give us as much time as possible to enable us to get reservations, and, in that case, we send letters which cost practically nothing. When tourists come along at the last moment, and we have to wire for accommodation, it costs them 2s. 8d. for a reply-paid telegram. Sometimes weeks elapse before it is necessary to wire for reservations. Most of our business is done by post. Under existing circumstances, we would not use a telephone if it were available in preference to telegraph. The telegraph is much cheaper. There is very little tourist traffic to King Island. With telephone facilities that traffic might develop, but not to any great extent. I am not connected with commercial interests at all, and I have no knowledge of the trade with King Island.

115. *To Senator Simpson.*—Even within Tasmania the tourists bureau, when communicating with each other make little use of the telephone trunk line. Most of our communications are by letter or telegram. It is problematical whether the average tourist would use a telephone connexion with the mainland. Of course the telephone grows on one, but it is a matter of pounds, shillings and pence. But when we ring up Hobart it takes some time before the call can be put through. The tourists are anxious to see the sights and they prefer to send a wire rather than wait at a telephone booth perhaps for three-quarters of an hour before being put through to their relatives or friends in Victoria. We use the trunk line to Hobart only in urgent cases, and that is not very often. A telephone connexion with the mainland would be of little advantage to my office under existing circumstances.

116. *To Mr. Holloway.*—I am referring only to the tourist traffic. During the last eight or ten years the Tasmanian Government has spent a considerable sum of money in developing the tourist traffic, and we hope to develop it more in the future. Our experience is that the business people who come to Tasmania for a holiday like the idea of having left their business worries behind. For instance, I was speaking to two tourists this morning and they could not tell me what was the day of the week. They did not even know the day of New Year's Eve. Most tourists are like that. They leave their worries and troubles behind. My own private opinion is that a telephone connexion with the mainland would be of benefit to business people. I was for years on the north-west coast and I know that a telephone service would be of great benefit to the produce merchants there. Prices fluctuate quickly and it would certainly be an advantage to the merchants and particularly to the producers on the north-west coast to be able to gain immediate information as to the state of the market on the mainland.

The witness withdrew.

William Stewart Johnstone, merchant and chairman of the Merchants Association, Launceston, sworn and examined.

117. *To the Chairman.*—I am aware of the proposal to connect the telephone system of Tasmania with that of the mainland. This project has been considered by my association, and we are strongly in favour of it. In these times we have to meet tremendous competition with the mainland. The prices there are constantly altering and our only means of ascertaining the position is to send urgent reply-paid telegrams which, under the best of circumstances, are unsatisfactory. If we send a wire in the afternoon we do not get it before we close in the evening. We are at a distinct disadvantage compared with Melbourne houses. We wire to the mainland for quotations and before we know where we are tariffs have been increased and prices altered. We feel that with telephone facilities we would be placed more on level terms with Melbourne merchants. We do a great deal of business with the mainland by telegraph. Of course, we have a standing order in respect of sugar and other main necessaries of life. If the telephone rates were about the same as telegram rates, the telephone would be used considerably. I saw the charges enumerated in the newspaper this morning, and I consider them very reasonable indeed. I am sure that the merchants would prefer to do their business by telephone rather than by telegram. In our business we constantly send representatives to Melbourne. We had three there last month, and our only means of ascertaining what they are doing, is to communicate with them by urgent wire, sometimes consisting of 40 words. Even then we do not know what they are doing until the next day, and often

their replies are unsatisfactory. We are at a tremendous disadvantage in that way. We do not gain anything by sending an urgent telegram after 4 p.m., so we often send a long lettergram at night asking for an urgent reply at our expense. That is a disadvantage. If a telephone connexion were made with the mainland, we would still send representatives to Melbourne, but not so many as we do at present. It is of considerable advantage to us, but needlessly expensive to have a representative in Melbourne. We have a branch house at Devonport, and between us we send quite a lot of telegrams. There are eight or nine other merchants in Launceston alone. There is a distinct recruitment on the part of the business people and the residents of Tasmania generally, owing to the fact that this State is not linked up with the mainland by telephone. We feel the lack of this facility strongly. We are being taxed heavily to have the honour of being a member of federated Australia, but we are not getting much benefit from it. My business started in 1822. Things are getting steadily worse. Competition is felt in a little State much more than it is in a larger State. I am certain that the telephone, once established, would be readily availed of. I know nothing of the King Island trade with Tasmania. I recently met a man who formerly lived at King Island. He said that he was so isolated there that he refused to allow his family to stay any longer. The conditions were so unreasonable that he preferred to live in Tasmania. We used to do quite a lot of business with King Island, but it has gradually drifted to Melbourne, as the shipping service to Melbourne is more convenient than it is to Launceston. Tasmania does practically all the business with Flinders Island, because its shipping service is convenient. I do not suppose that the telephone would make much difference to our trade with King Island, because that place is closer to Melbourne than it is to Launceston. The Launceston merchants do most of the business with Flinders Island. I am satisfied that the disadvantages now experienced by business men and merchants in dealing with the mainland would disappear to a great extent once a telephone service were established. I prefer a submarine cable service to a radio service because the former would ensure a continuous and dependable service.

118. *To Mr. Holloway.*—The business people of Tasmania have, in the past, suffered unfair competition from the mainland because of the lack of telephone communication. This facility is long overdue. Sometimes when information is vital, we send telegrams to three or four different brokers entailing three or four different costs, whereas one telephone conversation with the mainland would avoid all that trouble and expense, and we would be more sure of the result. Let me give a case in point. Recently, the tobacco duties were raised and we could not ascertain whether the tobacco company had increased its prices. We sent urgent wires which brought no response. The tobacco company itself did not know what was happening. The position was that whereas there was a tendency here to alter prices, the prices in Melbourne remained unaltered. While we are without telephone connexion with the mainland we are at a decided disadvantage as compared with the mainland merchant when a sudden alteration of tariff takes place. People who have large stocks do not know what to do. When a wire does not elicit a satisfactory answer, we have to repeat it, and that of course is additional expense. I have a number of relatives and a daughter in Melbourne, and when anything goes wrong we have no end of trouble in communicating with one another, whereas with a telephone connexion our anxiety would be relieved straight away. We have felt the lack of this facility severely. The infrequent mail service and the difficulties of transport furnish another reason why telephone connexion should be established with the

mainland. If we had a daily mail naturally business would increase and the telephone would be more freely used. Practically every modern development, including the telephone, creates its own business. Motor transport has increased. Aviation is extending all over the world, and I am quite sure that once the telephone is established it will be freely availed of and the revenue from it will rapidly increase. I consider that that departmental estimate of revenue is rather pessimistic.

119. *To Senator Sampson.*—My telephone business is probably one of the largest in Tasmania. This State's isolation should be removed as much as possible.

(Taken at Hobart.)

FRIDAY, 16TH JANUARY, 1931.

Present:

(SECTIONAL COMMITTEE.)

MR. LACEY, Chairman;

Senator Sampson | Mr. Holloway.

George John Braithwaite, Superintending Engineer, Postmaster-General's Department, Hobart, sworn and examined.

120. *To the Chairman.*—I am aware of the proposal to connect Tasmania with the mainland by telephone. In fact, I was asked by the department to prepare a report on the subject. I have prepared several reports. There are two proposals—one a radio service and the other a submarine cable service. The advantages of the proposed submarine telephone cable are—

1. Tasmania as an island and an integral part of the Commonwealth would be linked up telephonically with the mainland and with the outside world.

2. No communication scheme for the Commonwealth as a whole can be regarded as complete until every State is linked together and all calls can find a common point or point of connexion to transmission systems with countries outside Australia. The importance of speech communication to each and every State from a business and social point of view is paramount from the point of view of the development of a State and especially to Tasmania.

3. The telephone cable would be stable, secret and give continuous service, and moreover, would connect King Island to the mainland and Tasmania. It would provide ample initial traffic-carrying capacity and would meet increasing traffic demands to an ultimate capacity sufficient for many years to come.

4. It would probably promote, to some extent, the increased use of telephones in Tasmania in exchange networks, and, certainly, indirectly add to land trunk line revenue in Tasmania, King Island, and on the mainland.

5. Would provide a supplementary telegraph channel which would be of great value in case of a breakdown of the existing submarine telegraph cables connecting the mainland and Tasmania.

6. Would provide a telephone channel for broadcasting purposes.

7. Economically, it is the sounder of the two proposals.

Its disadvantage is its high initial cost. In respect of the proposed radio link, its advantage is its comparative low initial cost. Its disadvantages are—

1. Limited traffic-carrying capacity, initially and impracticability of increasing the capacity after installation.

2. Difficulty in ensuring secrecy of transmission.

3. Comparative unreliability as a completely satisfactory transmission system, especially with respect to intermittency of service.

4. Would not cater for King Island.

5. Unsatisfactory economic aspects.

These disadvantages are very serious. The radio service would not carry even the initial business that we might expect, and has no prospect of ever paying its way. If established, it might have to be scrapped later on. It might simply demonstrate the need for a com-

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munication link, only to force the provision of a more satisfactory service, and the whole thing would have to be scrapped unless it could be used in some other way. That, generally, is my opinion of the two proposals. The telephone cable route is from Perkin's Bay, Circular Head, skirting Hummocks Island, calling in at Narracoopa at King Island, and thence to Lorne, Victoria. That is as good a route as will ever be opened. I have taken some part in making the recommendations regarding the selection of the sites. Perkin's Bay is quite a suitable landing place for a cable. It has a nice shelving and graded beach, and affords an excellent landing place at which the cable could be sunk into the ground. The site is about 2½ miles from the Stanley post office, at which the connexion would take place with the land trunk line. The Perkin's Bay site is a very good one, and was the site selected for the first submarine cable laid between the mainland and Tasmania in 1859. The proposed route is a distinct improvement on the route of the first cable. That cable was landed at Cape Wickham, on the north of King Island, and taken across the island to Currie. The coast at Cape Wickham is rough and rocky, and the cable chafed through within six months, and was abandoned in 1861. After leaving King Island the cable crossed the Three Hummocks, and landed within half a mile of the site of the landing of the proposed cable. In 1869 the Eastern Extension Company laid its first submarine telegraph cable. A second cable was laid in 1885. They were superseded by our own cables, which commenced operation in 1909. The site at Perkin's Bay is suitable for a permanent landing place for cable. I do not think that there is any likelihood of trouble arising in respect of landing at Narracoopa. I have been all over the island, and I know that Narracoopa is nicely sheltered. The other side of the island would be a different proposition altogether. The Narracoopa site is all right. The route from there skirts the island, and continues to Lorne. I do not think that there can be any mistake about our selection of the site. It is proposed that the telephone cable shall be equipped initially with two channels. It is a complete three physical pair cable, but of course its ultimate capacity could be easily extended up to ten channels, according to the demands of business. This cable would provide a no-delay service, which would not apply to the same extent to a radio link. The submarine cable is much preferable to a radio link. The nature of the telephone cable is such that it is likely to give a much more satisfactory service to the public. It would give a continuous service, and the traffic could be handled with much more surety than with a radio link. There would be less supervision of traffic, and growing developments would be able to be met. Of course, the cable would be of great value at any time as a supplement to the telegraph traffic over the existing cables. We have had breakdowns on those cables. If one breaks down the load is thrown on the other. Delays to traffic occur, and the cable is overtaxed. It may be of vital importance to have a standby in case both telegraph cables fail. With respect to the radio link, the proposed site of the terminal point would probably be in the neighbourhood of Carrick, about ten or twelve miles out from Launceston. That would be a suitable transmitting site. The receiving site on the coast would be near Devonport. The site would be right on the coast, and quite suitable for the reception of the Melbourne transmission. Both stations would be definitely linked up with our general communication system. The effect of the atmospheric conditions on the radio service would largely have to be ascertained by experts. Everybody knows that radio communication is subject to eccentricities, and there is a doubt as to what would happen during certain hours. A communication might not

be interrupted altogether, but the quality of the transmission would vary. Compared with submarine cable, the radio link could be cheaply constructed. The departmental estimate of the traffic is 100 calls a day—50 from Tasmania, and 50 to Tasmania. That is all that we can reasonably expect. The estimate of the carrying capacity of the radio link is only 50 calls, half of which is required at the start. I do not know of any radio service in respect of which one channel is conveying 100 calls a day. I think that the departmental estimate of the business to be expected is reasonable. I do not think that one radio channel would be capable of coping with the traffic offering after the first year, because a radio channel would not be able to handle any more business after five years' operation than it could at the initial stages. I say definitely, that it is the desire of the business people and residents of Tasmania to be connected by telephone with the mainland. Most of our business interests are focussed on the mainland, and how is business to be properly carried out without a means of quick communication with the mainland? How are we to get into touch with the outside world if we are not to be linked up with the mainland? If the business people of Tasmania did not advocate this telephone link they would not be alive to their own interests. There are, approximately, 12,000 telephone subscribers in Tasmania. The usefulness of the telephone system to the subscribers would be greatly enhanced if it enabled them to get in touch with the rest of Australia and the outside world. I have been to King Island. At June last there were 134 telephone subscribers there. A telephone link at King Island would certainly break down the feeling of isolation that exists among the residents. It would promote their business interests to the same extent, comparatively, as it would the business interests in Tasmania. I have given consideration to the question of bringing the submarine telephone cable via Flinders Island instead of via King Island, but the nature of the coast and the route generally via Flinders Island is nothing like as good as the proposed route. There is a bad bottom at Flinders Island, and the cable could not be laid without crossing the rocks, which is greatly feared by the cable engineer. Then again, the distance would be longer. There are other considerations which favour the King Island route. The number of exchange lines at Flinders Island is 26, as compared with 134 on King Island. The population is about the same. The telegraph and trunk line business is in the ratio of three at King Island to one at Flinders Island. The telegraph and telephone revenue at King Island is over three times as much as it is at Flinders Island. The value of production at King Island is about double that at Flinders Island. The area of King Island is, of course, much smaller than that of Flinders Island. Without having given this subject mature consideration, I do not see any prospect of adopting the route via Flinders Island. It would materially increase the cost of installation. It would be a most difficult route instead of the almost ideal route now proposed, and there would be a prospect of far less revenue. It is well known that telephone traffic, once an efficient communication is provided, develops quickly. That applies to all telephone trunk lines. An efficient service begets its own business. It creates a taste for the telephone among the public. Generally, the departmental estimates of telephone traffic are exceeded. The sites proposed for the various buildings are quite suitable. Of course, they have not been definitely decided, but the approximate locations are suitable. The site for the building in connexion with the submarine telephone cable is on the post office property at Stanley. The site is on a slope, but we can fit in a building of sufficient size there. There is no doubt about the landing site being available at Narreconnup. The radio building sites are

quite suitable, both at Carrick and at Devonport. I have not seen the plan of the proposed buildings, but I think that they should be of brick or concrete. It would be a serious thing if an expensive repeater were housed in a timber building only to be destroyed by fire. I do not think that the difference in cost between a timber and brick building should be considered in view of the added protection that a brick building would give against fire. It is important that we should ensure against fire, particularly in respect of expensive machinery. I think that there is sufficient risk of fire at King Island to justify a brick or concrete building.

121. *To Mr. Holloway.*—I favour the submarine cable as against a radio link, even though the cost of the cable is greater. In the last analysis the cable would be the more economically sound proposition. The radio service at the outset would not be able to cope with the traffic, and the initial plant would not permit of any further developments. On the other hand a submarine cable would cope with the traffic and permit of developments over a number of years. The secrecy and reliability of the cable are added advantages. It would be unfair to the business people of Tasmania not to provide them with modern telephone facilities. It is only right that the Commonwealth should look after the island State. Before federation our business was confined more within the State. We had our own distribution houses, who sent out their own commercial travellers; but we also did business with the mainland houses. A great change has taken place in business relations since then; most of our business is now with the mainland, and the distribution is largely done there. Goods that are not distributed there are imported direct from overseas. That change in business relations has made it all the more necessary that the business people of Tasmania should have speech communication with the mainland. It is more necessary now than ever before, and that is in direct consequence of the federation. Once the telephone is established it will be availed of by the business people to a greater extent than perhaps they themselves now expect. If the submarine cable is laid, it would be advisable to include King Island in the scheme. The department certainly favours that, otherwise it would not have made the proposal. I suppose that the extra cost of linking up King Island would be £8,000. Another important factor in deciding to include King Island in the scheme is that it will break the cable and allow the department to put in repeater equipment at the island. We would be fully justified in going to the additional expense of including King Island in the scheme. It is vital to the Commonwealth that the whole of Australia should be linked together by telephone. That applies to King Island, which is a part of Australia. It would be a great mistake not to take the opportunity of linking up with the island. If increased transport and mail facilities were given to Tasmania that would tend to increase the business carried out over the telephone. A railway communication or shipping service is a traffic channel in the same way as telephone communication is a traffic channel for speech, but there is a difference between them. The provision of shipping or train traffic channels, after all, is dependent on the need to transport people or goods. The transport of goods by means of ships depends, of course, on whether the goods can be marketed. That is a concrete matter. I do not think that the provision of increased shipping facilities would beget freight for those facilities to anything like the same extent that a speech channel would beget traffic. The provision of a speech channel would create business that otherwise would not be developed. If additional shipping were provided, and the freight were not offering, it would be a losing concern. It would not have the potentiality of

creating traffic. On the other hand, telephone communication creates business. People say to me that radio will supersede the cable. I have never thought that it would do anything of the kind, for the reason that the submarine cable for telegraph purposes throughout the world to-day has developed its business from the system of letter-writing communication, but the development of radio communication has simply created business that was never in existence before, and it has not seriously chopped into the ordinary business of the submarine cable. Radio has developed a business that previously was dormant, and is, therefore, quite different from shipping and rail communication. I think that increased shipping facilities would undoubtedly tend to make telephone communication more necessary and more frequently used. In addition, the transport of passengers by national airways would undoubtedly warrant a means of quick communication so as to take every precaution for the safety of passengers.

122. *To Senator Sampson.*—The department has for some years been considering and examining the prospects of speech communication with the mainland. I, myself, have had this question in mind for many years. As the Commonwealth develops, its means of communication will develop. The telephone from Perth to Brisbane is a great engineering achievement, and is part of the scheme for linking up the capital cities. Necessarily, any technical officer would be forced to consider the position of Tasmania. This State must come into the scheme, either now or at some time within the next twenty years.

The witness withdrew.

Maxwell Gordon Butcher, General Manager of C. D. Haywood Pty. Ltd., and President of the Hobart Chamber of Commerce, sworn and examined.

123. *To the Chairman.*—I am aware of the proposal to connect the telephone system of Tasmania with that of the mainland. The project has been considered by a special committee appointed by the Chamber of Commerce, and I am authorized to express its opinion. There is no possible doubt regarding the advantages which would accrue to this State if telephone communication were available. Tasmania, being an island, naturally requires all the means of accurate and prompt communication with the mainland. Telegraphic communication, in addition to being more costly, takes much longer and lends itself to errors which sometimes become very expensive to those concerned. According to statements made I understand that the cable system is much more reliable than the radio channel, and the latter, according to the experts, would be almost useless for the purpose, chiefly owing to the fact that the service would be in use only for twelve hours in the 24, and then not necessarily for consecutive hours. Possibly it might be at its best round about midnight, which would be almost useless. More use, for business purposes, would be made of the system during the usual business hours than at night time. The estimated cost of submarine cable is £150,000 and the estimated revenue at the end of ten years would be over £20,000, while the annual cost would be £13,000. In view of these figures my chamber has no hesitation in strongly recommending the installation of the submarine cable service. The average daily number of telegrams despatched from Tasmania to Melbourne is 206, and I feel sure that if telephone facilities were available the telephone would be used in a great number of these instances. From the mainland to Tasmania the number of calls would be considerably more. Business men to-day need to have reliable and speedy means of communication and it is only fair to Tasmania, as

part of the Commonwealth, and bearing her share of Commonwealth expenditure, that, in common with the other States, it be afforded this up-to-date service. There are many other forms of Commonwealth-owned facilities which, although bearing its share of the cost, this State, owing to its insular position, cannot share in the advantages of, and it is only common justice that this State be linked up with the rest of the continent in the same way that the other States are. Taking an average charge of 1s. per call (4s. 6d. Hobart, 3s. 6d. Launceston) and estimating that 200 calls would be made daily from the whole of the State, the immediate revenue would approximate £15,000 per annum. This is, of course, purely an estimate, but I feel that as the advantage of the service becomes more widely recognized the return to the Postal Department would be very quickly increased and a revenue would be derived by the Government. The Chamber of Commerce has in the past strongly opposed the ever-increasing Federal Government expenditure, but understands that this commission is collecting evidence solely as to the necessity or otherwise of a telephonic service to the mainland. The matter of whether the time is opportune for the necessary expenditure is one for the decision of Parliament. The following is a letter signed by the Chairman and Secretary of the Hobart Stock Exchange, of which the members of the Chamber of Commerce are members:—

The Hobart Stock Exchange, Collins-street, Hobart.
16th January, 1931.

The Chairman, Chamber of Commerce, Hobart,

WIRELESS TELEPHONIC COMMUNICATION BETWEEN
TASMANIA AND THE MAINLAND.

Dear Sir,

The members of the Hobart Stock Exchange have noted with interest that a committee is taking evidence in Tasmania regarding the above. Assuming that representations in support will be made by the Chamber of Commerce, we are requested to inform you that our members are strongly in favour of the scheme being carried out. It is felt that the facility is one to which Tasmania is justly entitled and one to which increasing support would be given by all sections of the business community.

In normal times the business transacted by the members of the Stock Exchange with Melbourne is very considerable, and there is not the least doubt that the telephone would be largely used if an efficient and satisfactory service is provided.

It is contended that the present cable system has severe limitations and there are on record many evidences of serious inconvenience caused to brokers through vexatious delays in delivery of cable messages.

We are yours faithfully,

(Sgd.) F. L. LANGFORD, Chairman.
(Sgd.) W. C. BULLOWS, Secretary.

There is a general desire on the part of the business community of Hobart to have telephone connexion with the mainland. If this facility were available, it would be freely used by business people. I do not think that the departmental estimate of 114 calls per day is excessive, particularly in view of the fact that a few days ago 206 telegrams were despatched in one day to Melbourne alone. Those telegrams, in some cases, necessitated replies. In addition, a good deal of business is done between Hobart and Sydney as well as between Launceston and Hobart. I certainly do not think that the departmental figure is over-estimated. As this facility becomes more generally known, its business will naturally increase, but I do not say that it will progressively increase. The community soon realizes the advantage of a new facility, and it is not long before they use it to the maximum of their ability. A telephone communication would undoubtedly assist in the transaction of business. Errors frequently occur in long telegrams, and, of course, they are unavoidable. I fully realize that telephone communication with the mainland would bring the subscribers in Tasmania in touch with the rest of Australia and the outside world. Tasmania is entitled to this facility in common with

the other States. In view of the fact that the telephone connexion would return interest and sinking fund payments and a substantial profit after the ninth year of operation, I consider it a reasonable undertaking, and my chamber is strongly of the opinion that no time should be lost in making this facility available to Tasmania. I have little knowledge of King Island. It is a good place for grazing, and business is done both with Melbourne and Launceston. I have no doubt that with telephone connexion the trade of the island would increase, and that, to some extent, would be an advantage to Tasmania. If a telephone service were instituted between Tasmania and the mainland it would be a mistake not to include King Island. I understand that that is also the opinion of the department. If a radio service would not be as reliable and dependable as a submarine cable service it should not be considered from a business point of view. As president of the chamber, I am not in a position to state definitely that the Commonwealth would be justified in making this expenditure at this time of financial depression. Many of our members consider that the time is not opportune for any additional Commonwealth expenditure other than that which cannot be avoided. On the other hand, certain big business men and prominent members of the chamber consider that a telephone service between Tasmania and the mainland is an urgent necessity, and should be put in hand as early as possible.

124. *To Senator Sampson.*—I am quite satisfied that if the telephone connexion were established, it would be availed of by business men generally. In my own business, I would use it extensively.

125. *To Mr. Holloway.*—The people of Tasmania, because of the lack of telephonic communication, are at a decided disadvantage, socially and domestically, compared with the people of the mainland. Most of the members of the Stock Exchange are members of the Chamber of Commerce, and they are certainly at a disadvantage. The lack of telephonic communication eliminates any chance of fair competition between the stock exchanges on the mainland and Tasmania. This telephone service is long overdue. I understand that if it were instituted, it would be used for wireless and broadcasting purposes from the mainland. I think that if speeches inaugurated by the Tourist Department here were broadcast on the mainland it would help the tourist traffic to Tasmania considerably. Telephone communication with the mainland would be of advantage to all sections of this community. The tourist business of Tasmania, which is extensive, would also share in the benefit.

(Taken at Hobart.)

SATURDAY, 17TH JANUARY, 1931.

Present:

(SECTIONAL COMMITTEE.)

Mr. Lacey, Chairman;

Senator Sampson | Mr. Holloway.

Evelyn Temple Emmett, Director of the Tasmanian Government Tourist Bureau, Hobart, sworn and examined.

126. *To the Chairman.*—I am aware of the proposal to connect the telephone system of Tasmania with that of the mainland. I have read accounts of the proposal in the press. I should say that in a normal year from 20,000 to 30,000 tourists would journey from the mainland to Tasmania. I am not in a position to say whether a large percentage of these tourists would use a telephone to the mainland, because, obviously,

they would not discuss their private business with me or my officers. From inquiries that I have made, I should say that it is reasonable to suppose that a small proportion of the tourists would use the telephone for private or business reasons. I have little telegraphic communication with the mainland. The number of telegrams sent from my head office to the mainland last year was approximately 140. I should say that none of that business would be transacted by telephone in preference to telegraph, because there is little urgency about our messages. We could not expect to get replies straight away, so that a telegram would really suffice for our purposes. It would give the officer who received it time to make the necessary inquiries and to reply to us. Tourists who arrive in Hobart go in and out of my office a good deal. I am not connected with business interests, and I do not know whether business people from the mainland would make use of the telephone to get in touch with their businesses on the mainland. Of course, I know that the business men of Tasmania are extremely keen on this proposal. I should say that a fairly large use would be made of a telephone connexion by the business interests of this State. There is practically no tourist traffic to King Island. If the island were connected with the mainland and Tasmania by telephone, I do not think that the tourist traffic to the island would increase to any appreciable extent. Flinders Island is an excellent tourist resort, but the traffic there is very small. Telephone connexion with the mainland would undoubtedly be of benefit to Tasmania.

127. *To Mr. Holloway.*—I do not think that telephone connexion with the mainland would assist the tourist traffic to any extent. We have our own offices in all the mainland State capitals and other large cities where people can get first-hand information respecting Tasmanian tourist resorts. They have no need to communicate with Tasmania itself. We keep our representatives in the other States continually posted as to local conditions. They know what accommodation is available in Tasmania generally. It is reasonable to expect that a small percentage of tourists would appreciate the facility of being able to ring up their homes and hear the voices of the members of their families or relatives. A small business would be likely to be developed in that way. Tasmania should have this telephone connexion so as to be on an equal footing with the rest of Australia.

128. *To Senator Sampson.*—It is reasonable to suppose that a telephone connexion with the mainland would be used by the merchants and potato-growers of the north-west coast so as to ascertain the extent of the fluctuations of prices in Sussex-street. There are over 12,000 telephone subscribers in Tasmania, and they, of course, would be potential users of a telephone connexion with the mainland. It is fair to assume that if this facility were afforded, its business would grow. Most facilities grow and do not dwindle. The Tourist Bureau would use the telephone very little. We do not use the telegraph service very much. I cannot think of any occasion on which I would require to send an official message by telephone. Tourists would probably use the telephone for sentimental reasons.

The witness withdrew.

Frederick William Bennett, managing director of Fred. Bennett Pty. Ltd., fruit-brokers, sworn and examined.

129. *To the Chairman.*—I am aware of the proposal to connect the telephone system of Tasmania with that of the mainland. I am particularly interested in this project, because I understand that, if Tasmania is linked by telephone with the mainland, we shall be able to put in a trunk-line call to Europe. I have mentioned

this project to other fruit-brokers in Hobart, and they all agree that a telephone connexion with the mainland would be a great benefit to the trade in general, and that they would use it extensively. Let me give one instance. Last May a matter of urgency and importance cropped up in Queensland. We exchanged the usual telegrams. The people there requested me to speak to London on the telephone, and as a result I had to take a special trip to Melbourne to do that. A business man cannot afford that waste of time. At any rate, I used the telephone in Melbourne, and the result was satisfactory. The cable bill of my firm is about £400 a year. From the beginning of December to the middle of May, the end of the fruit shipping season, we are practically in daily touch with the United Kingdom, Germany, and other countries. If we could get into touch by telephone it would be of great benefit to us. I have spoken to several other exporting firms, and they all agree that telephone connexion with the mainland would be very beneficial to them. I was speaking to a fruit exporter about half-an-hour ago, and he informed me that, if the telephone were available he would use it immediately, because he had a matter of urgency to investigate. He sent a cable-gram at about 9.30 this morning, and had a telephone been available he would not have hesitated to use it instead. There is undoubtedly a general desire on the part of the business community of Tasmania to have telephone communication with the mainland. About a fortnight ago I took a trip to Melbourne which would have been avoided had the telephone been available. I went to Melbourne on fruit business in order to ring up Adelaide. I should think that the department's estimate of 114 calls a day is reasonable. I know that people in Devonport would, during the produce season, use the telephone a good deal. We would certainly use it here. There is no doubt that the service, once established, would grow rapidly and soon become popular. Business people and residents generally would prefer to talk over the telephone instead of exchanging telegrams. There is nothing so effective as a chat on the telephone, because one's views can be expressed much more explicitly in that way than in telegrams or cables. I have had experience of long-distance telephones in Europe, and I found them of great benefit—much better than letter-writing. With a telephone connexion we would certainly be able to keep in closer touch with markets and obtain information much more quickly than we do at present. Tasmania is entitled to telephone facilities in common with the rest of Australia. That is only our due. We have always felt that we are being badly treated compared with people on the mainland. People in England have asked me why it is that they can ring up Melbourne and Sydney, and not Tasmania. We are certainly at a disadvantage compared with the people on the mainland. If this work would return interest and sinking fund payments, and provide a substantial profit, after the ninth year of operation, I certainly consider it a reasonable business proposition. I have no knowledge of King Island, but I should say that, with telephone communication, its trade would develop. It is only right that the King Island people should share in any facilities that are afforded to Tasmania generally. The residents of King Island are very isolated. Despite the financial depression, I consider that the Commonwealth would be justified in embarking upon this expenditure. I favour a submarine cable as against a radio service, because I understand that it would give a reliable and dependable service for 24 hours of the day, whereas with radio the service would be intermittent and subject to interruption. The uncertainty of the radio service would be a disadvantage.

131. *To Senator Sampson.*—I am certain that quite a number of fruit exporters in Tasmania would use

the telephone if it were provided; in fact, a fruit-grower here and myself would have made use of it to-day.

131. *To Mr. Holloway.*—The telephone service would be availed of almost in the same proportion at this end as at the other end by those engaged in the fruit business. The cable business is absolutely enormous. At least one or two cables are sent every day by my firm, and larger firms send more. Very often we have to repeat telegrams. We had trouble with beam messages in code, but of late the trouble seems to have been overcome, and we do not have the delays that we suffered previously. It is quite common for growers to have to waste a day in answering a cable because of the message being mutilated, and, of course, when quoting prices, the figures have to be correct. A slight error in a code word might alter the whole text of the message, and cause serious loss. It is a common occurrence to have cables repeated. From a business point of view, telephonic communication would be much more satisfactory. Because of the absence of this facility, the business people of Tasmania are at a disadvantage in competing with the business people of the other States, and it would help us considerably if we were placed on the same footing as the people on the mainland in respect of telephone facilities. I might add that, when I telephoned from Melbourne to London, I had no difficulty in hearing and conversing. It was just like talking to a person in this room.

(Taken at Stanley.)

TUESDAY, 20TH JANUARY, 1931.

Present:

(SECTIONAL COMMITTEE.)

Mr. LACEY, Chairman;

Senator Sampson | Mr. Holloway.

Kenrick Laughton, Solicitor and Master Warden of the Marine Board, Stanley, sworn and examined.

132. *To the Chairman.*—I am aware of the proposal to link the telephone system of Tasmania with that of the mainland. There is a desire on the part of the people of Tasmania to have a telephone connexion of that kind. When this question was first mooted it caused some discussion, but the general opinion of people in various walks of life was that it would be of tremendous advantage to Tasmania to have a telephone service with the mainland. Such a service would be beneficial to the shippers and merchants. It would enable those interested in timber and produce to keep in touch with the markets on the mainland. I was in the timber industry for seven years, but severed my connexion with it on the 9th June last. On many occasions, had I been able to have a few minutes' conversation by telephone instead of exchanging telegrams with the mainland, it would have been of tremendous advantage to me as a sawmiller. It would have been of advantage also to the broker or merchant with whom I was dealing. Telegrams are frequently exchanged because of the rejection of timber supplied under various contracts. Delays occur and sometimes it is advisable for me to go to Melbourne. I have taken a trip on five or six occasions in preference to going to the bush by telegraphing. The proposed telephone service would be of tremendous advantage because it would enable us to communicate with America and European countries. We send a quantity of produce to Brisbane, Sydney and Newcastle, and it would be of considerable advantage to us to be able to speak by telephone to merchants there. I do not say that the service would be largely used in the first year, because

it would be a new thing, and the people would have to get used to it, but after it had been installed for some time it would be subject to considerable use. We have to consider the social aspect. I have a married daughter in Victoria, and if a telephone service were available my wife would use it once or twice a week. The service would be used to a great extent particularly at Christmas time, and it would certainly be a revenue-producing source. I do not think that the departmental estimate of 114 calls per day during the first year is excessive. Had the service been available when I was connected with the timber industry, on occasions I would have put in five or six calls a day. When the telephone first came to this district, people hesitated to be connected with the exchange, but now we have as many as 30 or 40 connexions in this back country. Most of the farmers have installed telephones. Surely that is an illustration that telephone connexion with the mainland, when established, would develop rapidly. The people in Tasmania are entitled to the facilities that are enjoyed by people on the mainland. We are cut off from the rest of Australia, and cannot telephone to the various States. We have to spend money on telegrams, and we consider that we are justified in supporting this proposal so long as the cost is not excessive. On numerous occasions I have had to repeat telegrams because of misunderstandings and mutilations, whereas a conversation by telephone would have placed the matter beyond all doubt. I suggest that during the first two or three years of the operation of the service there would probably be a loss, but as soon as the people became used to the facility, it would become revenue producing. I think that the telephone services throughout the Commonwealth are paying, and I have no doubt that unless this country becomes bankrupt, this service would pay within nine years, in fact it would pay possibly within three years. I have been to King Island, and the residents there are very energetic. They have wireless facilities. The isolation of the island has retarded its progress, and if the people are to stay there, they must be given every facility to lessen their isolation. Telephone connexion with the mainland must necessarily make the settlers more contented. It would also enable them to keep in touch with their markets. The island produces butter, cheese and fat stock. Melbourne is its main market, and it is only right that the producers should have an opportunity to converse by telephone with the people on the mainland with whom they are contracting. The cable should go via King Island, because that is the shortest distance across Bass Strait. The original cable to Tasmania went via King Island and Hummocks Island. Telephone communication with King Island would be of tremendous advantage to its residents and Tasmania generally. If this facility were established, the trade between Tasmania and the mainland would increase by leaps and bounds. The Commonwealth would be justified in incurring this expenditure despite the existing financial depression. I prefer a submarine cable in preference to radio. The cable would ensure reliability and secrecy, whereas the radio would not. A telephone service would be of no use if, when I am making a deal, my competitor could listen in and alter his prices accordingly.

133. *To Mr. Holloway.*—During the seven years I was connected with the saw-milling industry telephone connexion with the mainland was a long felt need as far as I was concerned. I have had business in Hobart, and have been able to communicate with persons in that city by telephone in a way which would not be possible by telegraph. The mainland business people have an advantage over us in that they can communicate by telephone with the various States on the mainland. They can keep in close touch with the markets of Victoria, Queensland and New South Wales. We are at a great disadvantage particularly in regard to

the potato market. Telegraphic communication is not so satisfactory as telephonic communication. In a six minutes' conversation more business could be done than perhaps in twelve hours by telegraph. Telephone communication would be of tremendous advantage to business people like Jones & Company and the big fruit merchants and brokers in Hobart and Launceston and along the Tamar Valley. I am quite certain that the use of the telephone would increase. Of course a lot of people would not appreciate its benefit for at least two or three years, but after that it would go ahead by leaps and bounds. This service must be established sooner or later, and no matter when it is established we shall have to educate the people to use it. I understand that it would be an advantage to break the cable at King Island to enable maintenance and repairs to be effected. It sometimes happens that a vessel does not call at King Island for a fortnight, and it would be of tremendous advantage if the residents of King Island could telephone Tasmania to ascertain when vessels were likely to call. As a matter of justice Tasmania is entitled to telephonic communication, particularly in regard to its trade with Melbourne and Sydney.

134. *To Senator Sampson.*—If the people of the mainland want the residents of Tasmania to cease talking about secession from the federation, we should be given the facilities that are enjoyed on the mainland, and particularly telephonic communication with the rest of Australia and the outside world. We are only 260 miles from Victoria. A telephone communication would undoubtedly bring us closer to the mainland.

The witness withdrew.

Thomas West Thomas, Manager of the Bank of Australasia, Stanley, sworn and examined.

135. *To the Chairman.*—I am aware of the proposal to connect the telephone service with that of the mainland. I have listened to most of the evidence of the previous witness, and I agree generally with him. I have had the advantage of being a bank official in Victoria, and I, therefore, fully realize the disadvantages under which Tasmania is suffering. As a banking business, we have to keep in touch with the mainland from time to time, and for that purpose use the telegraph service on occasions. A telephone service would be much more preferable to a telegraph service. Our head office in Melbourne has the final jurisdiction in respect of many matters arising here, and by the ordinary channel it takes seven or ten days before we get a reply from head office. Whereas if we could discuss various matters by telephone a lot of time would be saved, and the result would be much more satisfactory. That applies generally throughout Tasmania. I come into contact with a large section of the community, and I know that there is a general desire on the part of the residents to be linked with the mainland by telephone. This service is a necessity, and would be a distinct advantage to Tasmania. It would place this State on an equal footing with the other States in regard to business relations. I have been in Tasmania for three years, but I have little knowledge of King Island. The residents on the island are subject to isolation more so than we in Tasmania proper. Their shipping service is irregular because of the vagaries of the weather. In certain winds and tides, boats cannot stop at King Island, and the mails are consequently over-carried. The mail service cannot be depended upon. I prefer the submarine cable to radio, because the cable has the advantage of secrecy and reliability. These two things enter a good deal into business relations. The radio service would be likely to cause delay.

136. *To Senator Sampson.*—We would avail ourselves of this facility if it were established. There is a distinct need for it, and it would save time and inconvenience. We might go six months without putting through a call, but at other times we might put through three calls within a week.

137. *To Mr. Holloway.*—The radio service would be intermittent and unreliable, and it would be preferable to install a submarine cable even though it is more expensive. If a radio service were installed, and a person could not use it when required, he would soon become disgusted and send telegrams instead.

The witness withdrew.

Arthur Charles Smith, general storekeeper and produce merchant, Stanley, sworn and examined.

138. *To the Chairman.*—I am aware of the proposal to connect the telephone service of Tasmania with that of the mainland. I have heard most of the evidence of the previous witnesses, and generally I agree with it. A telephone service to the mainland would be of great advantage to Tasmania. We do most of our business with the mainland, and we use the telegraph a good deal. A personal touch is obtained by telephone, which is not possible by telegraph. At present, when ordering goods, we may exchange several wires with the mainland, and then not be quite sure until the boat arrives whether we have the right goods or not. Orders by telephone would be much more satisfactory. We frequently have to send three or four telegrams when one telephone conversation would be sufficient. I am a native of Tasmania, and have lived here 32 years. The departmental estimate of 114 telephone calls a day may be slightly excessive for the first year or two, but I feel sure that the telephone service would be a growing business. We are at a great disadvantage because we are not immediately connected with our markets on the mainland. Considerable stock, not so much sheep and lambs as cattle, are shipped from here to the mainland. If they are not sold immediately a wire is received to that effect. If we could communicate by telephone, we would know what to do with the stock. Very often we are involved in heavy expenditure in carrying stock for another week or fortnight. It would be a great advantage if we were in closer touch with the market. The same thing applies to the shipping of potatoes from Tasmania to the mainland. The general desire of the people of Tasmania is that they should be on the same footing as the people of the mainland, particularly in respect of business relations. If ever there was a time when the man on the land required assistance it is now, and telephonic communication with the mainland would be of great help to the man on the land by enabling him to place his produce on a favorable market. That would apply also to the producers on King Island, because they are in the same position as ourselves. They are at a great disadvantage compared with the growers of Victoria and South Australia, and it would certainly be of advantage to them to be linked by telephone to the mainland. We ourselves have to keep in touch by telegraph with the produce market on the mainland, and it would be of distinct advantage to us to have telephonic communication with Sydney and Melbourne.

139. *To Mr. Holloway.*—Telephonic communication would enable us to keep in touch with fluctuating prices on the mainland, and I have no doubt that many contracts would be entered into by telephone which would otherwise be impossible. We have had experience of produce being forwarded to Sydney, and condensed, and we know nothing of it until ten or fourteen days later. It is then too late to do anything

in the matter. Frequently our produce arrives on the mainland when the market is glutted. That would be avoided if we had telephone communication with the mainland. Our stock goes mostly to Victoria, and if we could gain immediate knowledge of the state of the market, stock just about to be shipped would often be held back until the market improved. When the stock arrives in Melbourne, and is not sold, we have to bear excessive charges for paddocking, &c. Periodically the same thing applies in regard to potatoes and swedes, shipped to Sydney markets. In addition, a telephone service with the mainland would be used extensively from a domestic and social point of view. Once the service were established the tendency would be to use it more and more.

The witness withdrew.

Thomas Andrew Moore Campbell, Rector of Stanley, and Councillor of Circular Head, sworn and examined.

140. *To the Chairman.*—I have been a resident of Stanley for nearly seven years, and during that time I have certainly realized the necessity for having telephone communication with the mainland. My knowledge is fairly wide, not only of Tasmania, but also of Australia generally. I have lived north, south, east and west in Australia, and also at King Island. There is undoubtedly a need for linking up Tasmania with the mainland by telephone. I substantiate the evidence of the previous witnesses, but one aspect has not yet been mentioned. People sometimes come to me in my capacity as a priest and ask me to invest money for them. If I could get into touch with the Melbourne exchange by telephone I would do much better business than I do at present, because of having to communicate by telegraph. Telephone connexion in that respect would be of great advantage. I take it that this service, if installed, would, in common with most telephone installations, grow rapidly. I well remember when King Island had no telephone system at all. When we set to work to obtain one, there was a good deal of talk to the effect that it would not pay, but to-day there are quite a number of subscribers at King Island. The people did avail themselves of that facility when it was provided for them. I think that the people would also avail themselves of telephonic communication with the mainland if it were provided. I was at King Island for four years. I know its possibilities because I lived there when there was no wireless service in operation. People would leave, and no one would know of their safe arrival at their destination until perhaps a month afterwards. The same thing applies to stock and produce. I have had the experience of travelling from Sydney to Melbourne to catch the boat leaving for King Island, and at times I have had to put in eight or ten days in Melbourne, not knowing when the boat would leave. That was before the wireless station was erected at King Island. I know full well the extent of the isolation of King Island. The business of that island would undoubtedly grow if it were connected by telephone with Tasmania and the mainland. It is certainly entitled to the service. The industries of the island comprise grazing chiefly, some pig farming, and the manufacture of butter and cheese. I consider that the departmental estimate of 114 calls a day is conservative. Telephone communication has been promised to us for a long time.

141. *To Senator Scammon.*—When I was on the island the mails were very irregular. For radio telegrams we have to pay double rate, which I think is very unjust. I can send a telegram from here to Thursday Island, and pay for it under the ordinary

land rate. To King Island the land rate does not apply. There is always an additional charge. I consider that King Island should be charged as a part of Tasmania and not as a separate island. I am quite satisfied that if telephonic communication were established it would be availed of by the settlers on the island. It is only fair that Tasmania should have the facilities that are enjoyed on the mainland. Quite irrespective of cost, we should be given telephonic communication to the rest of Australia and the outside world.

142. *To Mr. Holloway.*—A telephone service would be of advantage in respect of hospital work. When a death takes place it would enable the necessary arrangements to be made immediately. The interests of the settlers from Devonport to Stanley are allied more with the mainland than with Tasmania generally. Quite a number of people who previously lived here now reside in Melbourne. The residents here would use the telephone to get in touch with their friends and relatives on the other side. In justice to Tasmania, telephonic communication with the mainland should be established. It certainly would assist in developing Tasmanian trade. King Island should be linked up with the service, particularly if little or no additional expenditure would be incurred.

The witness withdrew.

Henry Montgomery Stuart, Clerk, representing Circular Head Produce Company, shipping agents, and also Horns Brothers, produce merchants, Stanley, sworn and examined.

143. *To the Chairman.*—I am aware of the proposal to connect the telephone system of Tasmania with that of the mainland. I agree with the evidence of the previous witnesses. The produce merchants here suffer considerable inconvenience, particularly in respect of the Newcastle market, because of the lack of telephone facilities. Invariably boats arrive here on Wednesday nights. We wire the brokers at Newcastle to ascertain the price of potatoes, swedes, and so on. It has happened that after the advice has been received, and the stuff is loaded on the boat for Sydney, a counter offer from Newcastle has arrived by wire. That offer cannot be taken advantage of because once the stuff is loaded into the Sydney space on the vessel it cannot be transhipped. Had telephonic communication been established, we could have readily ascertained the state of the market at Newcastle, and arranged our shipping accordingly. There is a general desire on the part of the merchants to be linked up with the mainland by telephone. Even in this district the service would be used extensively during the produce season. One particular merchant last year spent enormous sums of money in communicating by telegraph between here and the mainland. It frequently happens that a number of wires have to be exchanged with the mainland before a matter can be finalized, whereas one conversation on the telephone would have definitely fixed the business. I do not think that the departmental estimate of 114 calls per day is exaggerated, even at the inception of the service. The whole of the people of Tasmania would welcome telephonic communication with the mainland. It certainly would be of special advantage to the produce merchants. At present we suffer a considerable disadvantage compared with the produce merchants on the mainland.

144. *To Mr. Holloway.*—I should think that the telephone connexion, if installed, would have a tendency to assist the tourist traffic. As a matter of fact,

some of our friends are visiting us next week, and I feel certain that they would communicate with us if a telephone service were available.

145. *To Senator Sampson.*—There has been a feeling among the produce merchants on this coast for some considerable time that their business, particularly with Sydney and Newcastle, would be greatly facilitated if telephone communication were established between Tasmania and the mainland. I am quite satisfied that firms established at Stanley would avail themselves of the service.

(Taken at Burnie.)

WEDNESDAY, 21st JANUARY, 1931.

Present:

(SECTIONAL COMMITTEE.)

MR. LACEY, Chairman;

Senator Sampson | Mr. Holloway.

Russell Harris, Managing Director of the *Advocate*, daily newspaper, Burnie, sworn and examined.

146. *To the Chairman.*—I am aware of the proposal to link the telephone services of Tasmania with that of the mainland. Tasmanian newspapers are isolated. Telephonic communication between Tasmania and the mainland is an urgent necessity. I believe it would prove an immediate success. As managing director of the *Advocate*, a daily newspaper published at Burnie, I am in a position to give you the assurance that a very much larger business would be done by my company by telephone than is now possible by telegraph. The present system of telegraphing is costly and unsatisfactory, and is, to-day, one of the greatest problems of Tasmanian newspapers. The daily newspapers of the mainland States have the advantage of communication by telephone. Tasmania newspapers have so far had to suffer the heavy cost of cable transmission—half-penny per word, and this is acting as a very definite and decided check on the extension of our services. The tendency of late years has been for newspapers to give greater attention to British and foreign cables and to Australian news. The public desire for service of that sort can be met in Tasmania only by payment of exorbitant charges—charges out of all proportion to what the mainland papers have to pay, and so we have the extraordinary and manifestly unfair position that the comparatively small newspapers of Tasmania, with their limited scope, are placed at a heavy disadvantage. At the present time the *Advocate* uses the trunk-line connexion from Hobart and Launceston for an average of 1½ hours per day, every day of the week, and it would make even greater use of a Bass Strait telephone. I really believe that the reasonable charges suggested would lead to a steady extension of news service, and therefore to a still greater use of the Bass Strait telephone. Apart from press work, I would stress the great convenience which the Bass Strait telephone would prove to business men of North-Western and Western Tasmania. It is safe to say that the greater part of our business is done with the mainland, and the possibility of a talk direct with one's clients or merchants would be most valuable and create new business of an extensive nature. I am confident that the *Advocate* would be one of the greatest users of the telephone. I anticipate that we would be users of the telephone for from two to three hours per day. I am certain that the business done would astonish the department, and would make this telephone service one of its best investments. We

receive from 10,000 to 20,000 words a day. At present all our cables come from the Argus office. One message comes to Tasmania and it is telephoned to us. A great deal of our commercial matter is common to all newspapers. That comes in one message which is telephoned to the dictaphone in order to cut our costs. Only our interstate news service has a touch of individuality about it. Our service comes from the *Sun* and the *Herald*, and the service of the *Hobart Mercury* and the *Louiseville Examiner* comes from the *Argus* and the *Sydney Morning Herald*. If a telephone service were in operation between Tasmania and the mainland and the outside world, we would do as the newspapers in Victoria and New South Wales are doing—arrange with recognized newsagents to send messages at regular periods to be telephoned direct to a dictaphone. We would guarantee to use a telephone service for at least two hours a day. Such a service would enable us to make a big saving. There are three daily papers in Tasmania. Apart from general matter, I should think that those newspapers would make exclusive use of the telephone. They would be foolish if they did not. These three newspapers together might possibly occupy five hours of the 24 hours of telephone service. The telephone would displace the cable to a great extent as far as we are concerned. At present, we have to suffer many delays. We are in the unfortunate position that Burnie and the north-west coast is in a position different from that of Hobart. If there is a message to Hobart the line is clear, but if there is a message for us we must wait. We, on the coast, are always the last to have the use of the line. I have been a resident of Burnie all my life. There is undoubtedly a desire on the part of the community to have telephonic connexion with the mainland. I am positive that the service would be used because we on the coast do 90 per cent. of our business with the mainland. I do not consider that the department's estimate of 114 calls a day is exaggerated. It would be safe to say that the telephone would be universally used. Usually, the wires that we receive are correct. If a message is at all mutilated, one's own horse-sense can tell one what is wanted.

147. *To Senator Sampson.*—I think that from a social aspect the telephone would be used considerably. I am afraid that once this line is installed my domestic account will be considerably increased, because of telephone communication with relatives and friends on the mainland. The installation of this telephone is justified, financially and morally. There is certainly a moral justification for it. Telephone connexion with the mainland has been a long-felt need. We do not do business with King Island to any extent, but I think that it would be most desirable to connect King Island with the service while we are on the job. It would be a great facility for the islanders, because they are far more isolated than are the people of Tasmania generally. The residents of King Island do business with Melbourne and places along the Victorian coast as well as with Tasmania. As a newspaper, we would not use the telephone to ring up London or any other part of the world, because we get our news from the Australian Press Association which has a continuous cable service.

The witness withdrew.

Cyril Dennis Horne, produce merchant, Burnie, sworn and examined.

148. *To the Chairman.*—I am aware of the proposal to connect the telephone system of Tasmania with that of the mainland. The business community is unanimously in favour of this service. In fact, it would be of tremendous advantage to Tasmania as a whole,

and, if installed, would be largely availed of. The departmental estimate of 114 calls per day is a fair one. I consider that the use of the telephone would grow, particularly when things get back to normal. We suffer many disabilities because of the lack of telephone communication with the mainland. For instance, in our f.o.b. business we frequently wire for a quote, and it takes an hour, or perhaps two hours, to get a reply. When we are bartering or seeking counter offers it takes additional time, and in the meantime the market may fluctuate. On some days it fluctuates considerably, even within a few hours. Often we cannot get a reply back in time to enable us to take advantage of shipping by a vessel that is about to leave for the mainland. We also send telegrams to Brisbane, and it frequently happens that those at the other end do not realize that a boat is loading here with goods for that port. They dawdle about, and we do not get a wire from them accepting our quote until after the boat has left. We often have to wire, "Sorry cannot confirm, boat has sailed." If it can be shown that the telephone service will return interest and sinking fund payments and a substantial profit after the ninth year of operation, I consider it a reasonable business undertaking. The people of Tasmania are just beginning to wake up to the possibilities of long-distance telephone communication, and it is only recently that we have contended that we are entitled to this service. I prefer the submarine cable to a radio service. The people of Tasmania, of course, would prefer the most reliable system—one which preserved the secrecy of messages. I have traded with King Island; but its interests are more with Victoria than with this part of Tasmania. I think that the residents of King Island are well deserving of telephone connexion, and, if possible, they should be included in this scheme. Assuming that we develop sensible government, I consider that the Commonwealth would be justified in embarking upon this expenditure even at the present time. It is difficult to decide what projects are necessary while we are suffering a financial depression, but I certainly think it would be a wise move, from a business point of view, to connect Tasmania with the mainland. I have taken out the following figures in respect of telegrams that I have despatched during the last twelve months:—

	£	s.	d.
To Sydney — 436 telegrams	32	18	2
To Melbourne—155 telegrams	12	0	0
To Brisbane — 63 telegrams	4	12	5
To Newcastle — 16 telegrams	2	2	5
Total—699 telegrams	51	19	0

With telephonic connexion that cost would, to a great extent, be eliminated. Our business is done during certain days of the week, and unless I am sure that I can telegraph and get a reply back in time, I do not bother about wiring, but I would bother if I could get into immediate communication with the mainland by telephone. The trade between Melbourne and Sydney is done by telephone, and in that respect the traders there have a great advantage over the traders in Tasmania. The firms on the mainland can get into personal touch with each other, and oftentimes force a deal on the spot. That gives Victoria a considerable advantage over Tasmania. For instance, a Sydney merchant may receive our telegram. He has a day to consider it, and in the interim may ring Melbourne for counter quotes, and suit himself whether he accepts our trade. He has an opportunity to that extent of using our quote to force a lower quote from Melbourne. With a telephone service we would communicate with Sydney more than we do with Melbourne, and that, of course, would increase the revenue.

149. *To Mr. Holroyd.*—Without telephone facilities we are at a distinct disadvantage in competing with the other States. We are often hung up for information,

because, although we telegraph to Melbourne, we do not get an immediate reply. The personal touch given by the telephone would increase our trade with the other States considerably. Once the telephone were installed it would soon develop, both from a business and domestic aspect, assuming, of course, that it would be a continuous service. At one time the average farmer did not want a telephone, but now he would not be without one. We trade with both Victoria and New South Wales. We purchase seed oats, &c., and our drapery from Melbourne. We buy from Melbourne and sell to Sydney and Brisbane. We should be placed on the same footing as the other States in respect of telephone communication.

The witness withdrew.

William Henry Laird Smith, farmer and grazier and chairman of the Potato Marketing Board, Burnie, sworn and examined.

150. *To the Chairman.*—I am aware of the proposal to connect the telephone system of Tasmania with that of the mainland. I prefer a cable service to a radio service. Cable lends itself to the provision of a continuous service which might be split up in three degrees of service, viz., commercial business from 9.30 a.m. to 5 p.m.; press business, private and social business between 5 p.m. and 9.30 a.m. It might be advisable to make a concession to persons using the phone during hours when the use thereof is considerably limited. An efficient continuous service would rapidly result in an increased use of the service and consequently make it revenue producing at an early date after its establishment. The value of a telephone connexion depends largely on the efficiency of the service from a scientific and technical point of view. Cross talk and induction from telegraphic and electric light wires have now been practically eliminated. The question might be raised that telephonic communication would reduce the revenue derived from the existing telegraphic service. No doubt it would, but if both services were owned by the same governing party that should not be a serious matter as no doubt a telephone service would induce people to use it more frequently than they use the telegraph, hence the increase in revenue would well compensate the controlling party for the revenue lost to the telegraph branch of the service. I took a little interest in the establishment of communication between Melbourne and Sydney. That service has increased greatly. There are now three lines in operation. That increase was largely induced by the facilities given to the people to communicate with each other and consequently there was no loss on the line as was anticipated in the first place. I understand that if telephone communication were established with the mainland the *Advertiser* newspaper would use it for two hours of the day. Then again, it would be used by the Potato Marketing Board that we have established here. In the first place we did not have an office in Sydney, but later that was found to be necessary. A telephone would be invaluable to us in the direction of gaining information, and the value of the information that we receive is constantly increasing. In 1928, from February to December, when the Board was established, our payments for telegrams was £5 8s. 6d.; in 1929, from January to December, £70 10s. 6d.; and in 1930, from January to December, £38 3s. 7d. So that in a little under three years we paid £114 1s. 9d. for telegraphic facilities. With telephonic communication the revenue would have been considerably higher, because the information obtained in that way would have been of greater advantage to the producers on the north-west coast in general, and to the Potato Marketing Board in particular. The merchants meet in Sydney every Monday and a representative of our Marketing Board

is always present. With telephone communication we would know immediately after each meeting what prices were ruling for potatoes. Under present conditions we obtain only a brief outline of prices and other material information. We make our information available to all concerned, and, therefore, a telephone service with the mainland would be of great benefit to the producers on the north-west coast. We are anxious to give facilities for marketing by cutting out waste. The following figures relate to Tasmanian potatoes shipped to Sydney:—

Year.	Tons.
1927	73,930
1928	74,838
1929	45,456
1930	50,423

The total Tasmanian potato production from 1920-21 to 1929-30 was 3,957,183 tons, and the total value, £8,038,437. Sydney parity was allowed on all exports and Tasmania price for local consumption. Approximately 75 per cent. of the production was exported. The total quantity exported to Sydney was 2,967,881 tons 5 cwt., of a total value of £6,028,827 15s. The franchise of the Potato Marketing Board has now been extended by act of Parliament, to enable us to control products such as carrots, parsnip, tomatoes, swedes and turnips. We are endeavouring to increase the trade and the price to the producers, but to do that it is absolutely essential to have telephone communication with the mainland. Recently, a disaster befell us. Because of the wet season, blight attacked a shipment of potatoes. Had we been in telephonic communication with our marketing officer, he could have given us an immediate warning not to ship any more potatoes at that time. That would have prevented a considerable waste of product and loss of revenue. I have not been to King Island, but I think that if it were connected with the scheme it would be of great advantage to the producers there. I certainly suggest that the committee should obtain practical advice on the subject. King Island might be used as a testing station, and, if necessary, a relay station. Then, again, our trade with King Island in cattle is very good. A back trade is also done, but, of course, most of the trade goes to Melbourne. Telephonic communication with the mainland would undoubtedly increase the trade of King Island both with Tasmania and the mainland, and I consider that the service would be a good business proposition. I understand that the proposed route of the submarine cable is free from eruptions below water. That I consider is another argument in favour of the route. I happen to be a director of a dairying company which does considerable business with Victoria. It also ships largely to England. This year the value of the turnover was approximately £200,000. We do business largely with Victoria, and therefore a telephone connexion with the mainland would be invaluable to us in ascertaining the state of the market and advising whether to sell immediately or ship direct to London. Telephone connexion with the mainland would be of considerable value to the north-west coast of Tasmania. I have conversed with quite a number of business and influential men, and not one of them has raised any objection to this proposal. There is undoubtedly a general desire on the part of the Tasmanian people to have telephone connexion with the mainland. I prefer the submarine cable to a radio service. I do not know what may happen in the future in respect of the development of radio. There must be a certain amount of secrecy in connexion with business transactions, and, of course, secrecy is one of the advantages given by submarine cable. I think that the departmental estimate of 114 calls a day in the first year is conservative. It is wonderful how a telephonic service grows. People

who are living here derive much of their income from Victoria, and they, of course, would avail themselves of this telephone connexion. Although I do not like mentioning it, this coast—the most valuable part of Tasmania—is becoming more and more a suburb of Victoria. I have been in touch with business people, and they all deplore the absence of telephonic communication with the mainland. Once this service is installed it will rapidly develop. The Melbourne-Sydney service has made wonderful development. No one thought, in the first place, that three lines would be necessary. I recently attended a conference in connexion with the Agricultural Bureau and a representative of King Island informed me of the improved methods that were being adopted there in respect of the treatment of soil, &c., particularly for dairying purposes. King Island has a wonderful dairying system, and for its size is one of the most productive islands around Australia. I understand that a large trade could be worked up with Melbourne in respect of pig products. That, of course, will depend largely on the installation of the telephone. This service would not only increase the revenue of the department, but also build up the wealth of this State.

151. *To Senator Sampson.*—I would not like to say that the submarine cable could be used in case of emergency for telegraph purposes. When I was connected with the postal service, we used a telegraph line for telephone purposes, and it was all right provided that we could be sure of the insulation of the telephone. There was no actual connexion at all. It had to be done purely by induction. Immediately there was an actual connexion the service would close. I consider that the submarine cable service should be owned and controlled by the Government, principally because of its value from a defence point of view.

152. *To Mr. Holloway.*—I consider that national facilities should be under the control of the National Government, and particularly the telegraph and telephone services. We must take into consideration not only the direct revenue accruing from the service, but also its indirect revenue. For instance, if the press could obtain a cheaper service and greater facilities, it could give a better report of happenings throughout the world in respect of the production of certain commodities. That information would be invaluable to the Australian producers. The Government should not hesitate to install a telephone service to the mainland. I certainly favour the King Island route. Telephonic communication would also tend to develop the tourist traffic. Business people would be encouraged to come to Tasmania for the week-end or perhaps longer for pleasure and recreation. There is no better fishing elsewhere in Australia. People can come from Victoria to Tasmania by air in three hours, and there is no doubt that a telephone service would tend to assist the tourist trade. A business manager would be in direct communication with his sub-manager, and business could be done by telephone in a way that would not be possible by telegraph. The infrequency of the transport and mail service is another reason why telephone communication should be established. The Victorian business people do not seem to realize the value of the Tasmanian trade to them. They do not take the interest I should like to see taken in the progress of Tasmania. There is no doubt that telephonic communication between Tasmania and the mainland would be of considerable benefit to Victoria. It is of no use to say that we want to keep all the trade in the island. That we cannot do, and that is why I am so enthusiastic about the installation of this service. It will certainly develop the trade of Tasmania as a whole. Those in Tasmania who are interested in the activities of the stock exchange are at considerable disadvantage compared with

the people on the mainland. There is quite a lot of Victorian capital in Tasmania. We should not develop one section of the Commonwealth without some advantage being derived by the whole of the Commonwealth.

(Taken at Melbourne.)

FRIDAY, 33RD JANUARY, 1931.

Present:

(SECTIONAL COMMITTEE.)

Mr. LACEY, Chairman;
Senator Sampson. | Mr. Holloway.

Thomas Sydney Kettleford, company manager, Melbourne, sworn and examined.

153. *To the Chairman.*—I am aware of the proposal to connect the telephone system of Tasmania with that of the mainland. As an ex-Tasmanian I am naturally interested in the island. I am interested, also, in commercial circles to a large extent. My company controls the whole output of the Goliath Portland Cement Company in Tasmania. We distribute cement all over Australia. We have sent to Tasmania within a few years orders for something like £1,000,000 worth of cement; but we find ourselves at a serious disadvantage from time to time because of the lack of telephonic communication with the island. Cement is a material that cannot be stored for long periods, and unless we have immediate communication with Tasmania, and can control the shipments, we are at a serious disadvantage. We have to remove stuff from the wharf in three days, which is the longest period allowed by the Harbour Trust. When we have to cart it into store and pay storage the profit has practically gone. Had we telephonic communication with the mainland, we could control shipments, and to some extent eliminate the heavy additional cost of storage. At Railton, the site of the cement works, is inland and some 14 miles from Derwentport, it means that a considerable delay in the delivering of telegrams takes place, and our business is seriously affected in consequence. Our turnover with Tasmania is something like £250,000 a year. It is a considerable item for that State, and the quality of the product is so good as to have enabled us to gradually work up the business to its present proportions. Time after time we receive orders by telephone from Sydney, North Queensland and Adelaide. Then we have to communicate with Tasmania, which takes from one to three hours. The average time would probably be two hours. That is a serious disadvantage. We are constantly in communication with the works, and the lack of telephonic facilities is a serious factor against our being able to increase the business. The disabilities under which we labour are great. Tasmania is badly isolated. It is extraordinary that we cannot telephone to Tasmania, seeing that it is only 250 miles from the mainland. We can telephone to Czechoslovakia or North America, but we cannot telephone to Tasmania. At present we could, I think, use the air service and get a message to the works quicker than by telegram. Very often telegrams are delayed. Our disabilities are greater than those of other businesses. Trade barriers between States were supposed to be done away with completely by federation, but, unfortunately, they are not. On the Victorian Railways a freight preference is given of anything up to 500 per cent. on Victorian cement as against our product. That is a serious drawback. In addition, we have to pay a high freight between Tasmania and the mainland as against a low rail freight from Geelong to Melbourne. The preferential rail freight in Victoria are shown in the last column of the following table, and the higher rates

charged to the Tasmanian company are shown under the heading "Ordinary Freight Rate"---
 "THROUGH FREIGHT RATES"---5 RUCK LOTS ONLY.

Station.	Mileage from Sp. near street.	Ordinary Freight Rate.	Proportion of Through Freight (Exceeding 10s.) from Sp. near street to Destination.
		s. d.	Per ton.
Ashburton	97	4 5	2 8
Aspenvale	19	5 11	2 3
Paywater	19 1/2	5 11	4 3
Poll	7 1/2	4 5	1 7
Blackburn	11 1/2	5 1	2 8
Box Hill	10 1/2	5 1	2 8
Breda Meadows	10 1/2	5 1	1 7
Brumwick	4 1/2	4 5	1 1
Burnley	3 1/2	4 5	1 1
Burwood	9	4 5	1 7
Camberwell	6 1/2	4 5	1 7
Caulfield	7 1/2	4 5	1 7
Clats	21	5 11	4 3
Clayton	14 1/2	5 1	3 6
Clayton	13	5 1	2 8
Coburg	6 1/2	4 5	1 1
Cl. Fishburn	16 1/2	4 5	3 6
Croydon	19 1/2	5 11	4 3
Dandenong	19 1/2	5 11	4 3
Darling	8	4 5	1 7
Deer Park	11	5 1	2 8
Deer Park	20 1/2	5 11	4 3
Eltham	7	4 5	1 7
Epping	14	5 1	3 6
Essendon	5	4 5	1 1
East Kew	9 1/2	4 9	1 7
Eltham	17 1/2	5 11	3 6
Fairfield Park	6	4 5	1 7
Fitzroy	0	4 5	1 1
Glenhally	8 1/2	4 5	1 7
Glenroy	0	4 5	1 7
Greensborough	14 1/2	5 1	3 6
Hazeborn	4 1/2	4 5	1 1
Hickburg	9	4 5	1 7
Hyaber	7 1/2	4 5	1 7
Ice	5 1/2	4 5	1 7
Malvern	6 1/2	4 5	1 7
Merton	15 1/2	6 1	3 6
Merrida	21	5 11	4 3
Mill Brighton	9 1/2	4 5	1 7
Milham	14 1/2	5 1	3 6
Moraubin	11 1/2	5 1	2 8
Mordialsea	17 1/2	5 11	3 6
Moreland	5 1/2	4 5	1 1
Murrumbidgee	9 1/2	4 5	1 7
North Carlton	4 1/2	4 5	1 1
Northcote	6 1/2	4 5	1 1
North Brighton	8 1/2	4 9	1 7
North Fitzroy	5	4 9	1 1
Oakleigh	10 1/2	5 1	2 8
Port Melbourne	3 1/2	4 5	1 1
Ruswain	9 1/2	4 5	1 7
Riverdale	7 1/2	4 5	1 7
Rockbank	15 1/2	5 11	4 3
Sandringham	12 1/2	5 1	2 8
Somerton	13 1/2	5 1	2 8
South Brunswick	4	4 5	1 1
South Morang	17 1/2	5 11	4 3
Springvale	15 1/2	5 1	3 6
St. Albans	11 1/2	5 1	2 8
St. Kilda	4 1/2	4 5	1 1
Sunshine	7 1/2	4 5	0 8
Surrey Hill	8 1/2	4 5	1 7
Sydenham	15	5 1	3 6
Thornbury	12	5 1	2 8
Toorak	5 1/2	4 5	1 1
Traralgon	6 1/2	4 5	1 7
Truswell	12 1/2	5 1	2 8
Victoria Park	3 1/2	4 5	1 1
Windsor	5	4 5	1 1
Brooklyn .. .. .	..	4 5	NH
Focheray .. .. .	..	4 5	..
Kenilton .. .. .	..	4 5	..
Kennington South .. .. .	..	4 5	..
Laverton .. .. .	..	5 1	..
Newmarket .. .. .	..	4 5	..
Newport .. .. .	..	4 5	..
Spotswood .. .. .	..	4 5	..
West Footscray .. .. .	..	4 5	..
Wendle .. .. .	..	5 11	..
Williamstown North .. .. .	..	4 5	..
Williamstown Pier .. .. .	..	4 5	..
Yarraville .. .. .	..	4 5	..

Every effort on my part to reduce the differential rate has been unsuccessful. We have to contend against that differentiation all the time. Usually when tenders are called, and our tender is the same as that of the Geelong company, we get either one-half, one-third, or in some cases the whole of the contract, but in the case of the Electricity Commission, the Victorian Railways, and the State Rivers and Water Supply Board, we cannot get even portion of the contract if our prices are the same. In South Australia, also, there is a 10 per cent. preference against Tasmanian cement. That obtains in the case of government contracts. If telephone communication were established between Tasmania and the mainland, we might use it to the extent of 10s. a day. We would certainly use the telephone in preference to the telegraph. It would pay us to do so. Because of the lack of facilities for getting into immediate touch with the works, we have accumulated in store something like 2,000 tons of cement. That has been caused largely by being unable to regulate the shipments from Devonport, which is the port of shipment. The storage of that quantity of cement is a costly item. We would save considerable expense if we could control our shipments by telephone. I consider that the departmental estimate of 114 calls a day for the first year is conservative, judging by the use that we make of the telephone from Melbourne to South Australia and New South Wales. Under normal conditions, the telephone business between Tasmania and the mainland would increase from year to year as it has in the other States. Tasmania is not a big manufacturing State, and consequently an enormous quantity of stuff is manufactured in Victoria and shipped to Tasmania. That applies to a smaller extent to New South Wales, consequently a telephone service is almost essential to enable that business to be properly conducted at a reasonable cost. I have no doubt that other mainland persons doing business with Tasmania share my views. I understand that Mr. Bruce, who is in charge of the Tasmanian Tourist Bureau in Melbourne, has denied that when giving evidence he quoted the opinion of the Chamber of Manufactures. I have a great deal of respect for Mr. Bruce and his ability, but I am a member of the executive of the Chamber of Manufactures in Victoria, and I know that this proposal has never been referred to that body. I have never been to King Island, and have no business relations with the residents there. I understand that it is an excellent place for cattle-raising. I am unaware of any facilities at King Island for the manufacture of concrete. There is only one cement manufacturer in Tasmania, and that is our own company. If concrete buildings were to be erected at King Island, the cement would have to be shipped there from Devonport. A timber building would be cheaper, and there might be some difference in the freight. Timber would be from 10 per cent. to 15 per cent. cheaper than concrete, but we must not forget that the charges for maintenance and repairs are heavy in respect of timber buildings, whereas the cost of maintaining and repairing concrete buildings is comparatively much less. I come constantly into contact with Tasmanians, and every expression of opinion that I have heard from them has been strongly in favour of telephone connexion with the mainland. They consider that they should be placed on an equal footing with the rest of Australia. Tasmania is suffering severely because of its isolation, and if a means of rapid communication with the mainland were established its trade would develop considerably. If it can be shown that this service would return interest and sinking fund payments and a substantial profit after the ninth year of operation, I should regard it as an excellent business proposition. The Commonwealth would be fully justified in embarking upon this expenditure more so at the present time than ever before.

The depression, of course, has affected Tasmania in common with the other States, and if quicker communication were possible the trade of Tasmania would increase. That, of course, would be for the benefit of the other States.

154. *To Mr. Holloway.*—I am a fairly considerable shareholder in Amalgamated Wireless Limited, and I, therefore, do not care to express an opinion regarding the relative merits of submarine cable and radio services. The business people of Tasmania and the mainland are undoubtedly handicapped because of the absence of telephonic facilities. My own case is, I consider, startling evidence in favour of a better means of communication. Under existing conditions, the Tasmanian business people are suffering unfair competition with the other States. One instance is that an attempt is being made by the cement companies on the mainland to crush the cement company in Tasmania. Another illustration is the following extract taken from a letter sent to me by Mr. Clapp, the Chief Commissioner of Railways, Victoria, dated the 26th June, 1930:—

With reference to your statement that a preference is given by this department to cement manufactured in this State over your cement manufactured in Tasmania, I desire to say that where Victorian manufactures are offered at the same rate as those from other States, and the tender is also equal in other respects, it is the practice to accept the offer of the local tenderer.

I have been fighting to abolish that preference for three years, but so far without result. The State Electricity Commission, in respect of cement, gives preference to Victoria as against Tasmania. Fortunately for us, nearly all of the Labour municipalities in Melbourne—and there are many of them—refuse to fall into line with that policy, and, in many instances, we get the whole, or, at least, half of their contracts.

155. *To Senator Sampson.*—In South Australia the Government, in its contracts, gives a 10 per cent. preference to local cement, and in tendering we have to cut to the extent of 10 per cent. under the price of the South Australian manufacturer. There is no differentiation in railway freights in South Australia, but we have to freight our cement from Devonport to Adelaide as against the local company railings its product only a few miles.

156. *To Mr. Holloway.*—Telephonic communication with the mainland is very necessary because of the extent to which decentralization has taken place in Tasmania. Its isolation is an additional reason for establishing this service. It would be used not only from a business aspect, but also from a social aspect. My wife frequently telephones her friends in the other States. She is a Tasmanian, and her relatives are in Tasmania. It is only natural that she would communicate with them were a telephone service available. This facility is badly needed in view of the irregular and infrequent transport and mail services to Tasmania. If those services were improved there would be a greater necessity for telephonic communication with the mainland. I have been a resident of Victoria for ten years, and have always felt the inability to telephone Tasmania to be a serious drawback to Australia as a whole.

157. *To Senator Sampson.*—It is only right that Tasmania should be on the same footing as the other States in respect of telephonic communication. I do not suppose that any State has suffered more than Tasmania because of federation. Tasmania has paid for every public utility in the interests of the mainland, but, unfortunately, it has received nothing in return. It contributes towards the cost of maintaining telephonic communication in the other States, yet does not participate in the service. We have contrib-

uted our share to the cost of the east-west railway, which of course has been of no benefit to Tasmania. The lack of a telephone service with Europe is a considerable disadvantage to the fruit shippers in Tasmania, because frequently they have to make a special trip to the mainland to telephone to other parts of the world. Enormous use would be made of the telephone by those interested in the produce business on the north-west coast. They have developed a very fine trade with the mainland, and telephone communication would be of considerable advantage to them. Let me give an instance of the value of telephonic facilities. I am a member of the Melbourne City Council. We had a loan of £250,000 falling due at the end of this month. It was a 3½ per cent. loan, and the council were rather chary of floating it. It was felt that following on the Commonwealth loan we would not be able to float our loan successfully unless on a 6½ per cent. basis. The financial committee, of which I am a member, got in touch with the brokers, who in turn immediately communicated by telephone with London. By that means we obtained a loan of £250,000 in London and Australia in 24 hours. Surely that is proof of the value of the telephone. Telephone communication with the mainland would undoubtedly be of assistance to the Launceston or Hobart City Council if it wished to float a loan.

158. *To the Chairman.*—Tasmania not being a large manufacturing State, imports something like £2,000,000 worth of foods from Victoria every year, thus creating employment for thousands of men. Possibly if quicker means of communication can be secured by the telephone this business with Victoria can be considerably increased. Although Victoria can communicate per telephone with New Zealand, United States of America, Canada and the remotest parts of Europe, even to Rumania and Czechoslovakia, we cannot telephone to Tasmania, which is only 250 miles away. Rapid telephonic communication means that shipments of goods can be controlled much better, thus making for better commercial dealing between the two States.

(Taken at Melbourne.)

MONDAY, 16th MARCH, 1931.

Present:

Mr. Lacey, Chairman;	
Senator Sampson	Mr. Gregory
Mr. Cameron	Mr. Long.

Robert Crowe, Export Superintendent, Department of Agriculture, Victoria, sworn and examined.

159. *To the Chairman.*—I am aware that this committee is inquiring into a proposal to establish telephonic communication between Tasmania and the mainland. I am aware, also, that it is suggested that a submarine cable scheme be adopted which would, if adopted, take in King Island. I have been deputed to make representation on behalf of the inhabitants of King Island. I am personally acquainted with the position of affairs on the island. I have prepared for submission to the committee the following statement:—King Island is about midway between Cape Otway and the north-west point of Tasmania. It is about 40 miles by 16 miles, and its area is estimated at 272,000 acres. The present population is about 1,200 persons. Some years ago, the fattening of cattle was the chief industry, but, now, dairying predominates. Like everywhere else, there is a proportion of very good land, medium class, and poor quality, land. There is still a considerable area suitable for profitable development, which, although taken up, is not

improved or utilized. There are also many properties only partly developed. The capital value in 1922 was £352,433, the annual rateable value being £33,587. The exports for 1929-30 (consisting mainly of butter, cheese, cattle, pigs, sheep, wool, &c.) totalled about £92,000, and the imports about £10,000. Although the area of the island is a little more than one-third of that of Flinders Island, the capital and annual values are about three times as great. There is a wireless station, and telephone service—with about 143 subscribers. Owing to isolation, the welfare of the inhabitants of the island has been retarded in the past. Telephone communication with the mainland and Tasmania would be of great service, and tend towards the encouragement and development of settlement, business, tourist traffic, and generally. There is no doubt about it that, if there were telephone facilities with the mainland, the island would come to be recognized as a more desirable place to live in, and the number of settlers would be considerably increased. Whilst efforts are made to provide a regular shipping service, there are times when the weather does not permit of boats calling. The *Marrawah* leaves Melbourne every Saturday afternoon at 3 o'clock the whole year round, calls at Naracoopa, King Island, each Sunday morning, then proceeds to Stanley, Devonport, and Burnie, calling again at Naracoopa on Wednesday morning on its way back from Tasmania to Melbourne. When rough easterly weather is encountered, the *Marrawah* has to pass King Island without calling. This happens sometimes, and I have known of instances where passengers who booked for the island found their way back on the boat to where they started from, and made their second start a week later. On such occasions, mails are delayed, both incoming and outgoing, and telephone communication would be of great help and, under such circumstances, would be largely availed of. I have known of cattle to be brought into Currie 12 or fifteen miles, and, after waiting for some days, to be driven back to pasture again. Such experiences are disheartening and could be, to some extent, obviated if the settlers were better advised. Whilst it is true that they have the radio and local telephone communication, it is a fact that sometimes the local information received is not wholly reliable, and settlers would be able to personally confirm any general information, which perhaps did not come from a trustworthy source in the first instance. One of the drawbacks of the island is the inability to take advantage of favorable markets, especially for fat stock. If facilities existed for finding out that there was a shortage of supplies on the Melbourne or Launceston markets, and the likelihood of fullest rates ruling, steps could be taken to take advantage of same. I met Mr. Belton, late Minister for Agriculture, Tasmania, this time last year, after he had spent about one week on the island, and he stated that he came to the conclusion that King Island was the most prosperous district of Tasmania, and that it had greater possibilities than any other portion of the State. The potentialities of King Island for further development and settlement are very considerable. There is now abundant evidence of the productivity of what is called the timber country from north of the Pegarah-road right down to the southern point on the east side of the island. Mr. Easton Johnson has demonstrated what can be done on his property. Last Christmas I had a look over this place, and all through it I saw pastures—a mixture of clovers and grasses equal to the best found anywhere on the mainland. He was milking over 80 cows, and securing good returns. Not far away, I was surprised to see a herd of cows on beautiful clean clover on a property belonging to Mr. Bishop. I remembered this land when it was first cleared and ploughed. Cows were sown on it, but the crop produced was mainly corn. Exposure to the sun and air evidently matured it. There are

now a number of others following these examples, and encouraging evidence already exists of equally satisfactory results being obtained. In other parts of the island there are also great possibilities. I happen to know that there are farmers and graziers in dry areas of Victoria and parts of the Riverina who are realizing that it is much safer to operate in areas where the rainfall is more dependable. The use of superphosphates for pastures is not profitable where the rainfall is low or uncertain. The average annual rainfall on King Island for the last twenty years was 55.7 inches. This is well distributed, as follows:—January, 1.2 inches; February, 1.6 inches; March, 1.5 inches; April, 2.1 inches; May, 3.7 inches; June, 4.1 inches; July, 4.7 inches; August, 4 inches; September, 3.7 inches; October, 2.8 inches; November, 2 inches; and December, 2.3 inches. A State parliamentary delegation recently visited the island, and were most favorably impressed with the possibilities for development and settlement. They indicated that the question of re-using unimproved land, and improving it with the unemployed, was well worth considering. If this proposal materializes, many more resident settlers will be in occupation in a year or two. Apart from this, telephone connexion with King Island would pay better than any other route to commence with, and also there would be an immediate increase in the number of subscribers. There is no doubt that telephone connexion with the outside world would tend to promote more rapid settlement, with the result that there would be still more subscribers. Incidentally, it may be added that there are pheasants all over the island, and in the open season parties of sportsmen visit there each year. More would go, were it not for its isolation. To such people, the telephone would be a great convenience, and would be utilized. Then there are tourists—unfortunately too few. I know of no better place to spend a holiday. There are many others like me, but the island under present conditions is unthinkable. If, while away, they were assured that they could talk when they pleased with their family, friends or business places, it would be quite another matter. If it be decided to connect Tasmania with the mainland by telephone, I have every confidence in recommending King Island as the better route. I have not lived for any continuous time on King Island, but I own a property down there, and have been visiting the island at Christmas and Easter time for the last twenty years. My son was living there for a number of years, and during that time it was a great handicap for him, and also for me, not being able to regularly communicate with one another. Since then, of course, a wireless telegraph has been installed. The residents of King Island formerly relied mainly upon the export of fat cattle for their existence, but during recent years dairying has been developed, and is now their main industry. In addition to the existence of a butter factory, quite a number of people make their own butter, and I have seen as many as 900 boxes on the wharf awaiting export by the *Marrawah*. The value of this would be approximately £3,000. They also have one cheese factory, besides a number of dairymen who in a small way also make cheese. In my statement I made no reference to the crayfish industry, which is growing in importance. They have two hatches and boiling facilities, in which they prepare the crayfish for market; they are then packed in ice and despatched to Victoria. I do not know of any secondary industries likely to develop, although they may possibly do something in the future. The existence of telephone communication would, however, tend towards the improvement and occupation of a lot of land that is worth improving, and worth occupying, in fact some of the land on King Island is better than any land I know. The population would also be increased and present industries would develop. In regard to the possible development of a

remunerative tourist traffic, I think that is quite a possibility. On one occasion I remember there were so many people wanting to go to King Island that a berth could not be obtained on the *Wauchope* for some weeks. The *Panzerotti* was chartered to take tourists over, and the *Menavata* was also used as a passenger boat. I remember the time when at least 70 tourists were on the island at one period. Some were awaiting the arrival of the *Wauchope* in order to get away. I stayed for a week at Currie waiting for the boat. There were at least twenty people who waited all day for the ship, and were disappointed at her non-arrival. This went on for eight or ten days, and is given as an indication of the isolation from which the people on King Island suffer. During war time I have run the engine to enable wireless messages to be sent out by Chester Richardson, who was able to operate the plant. Amongst others, I remember one message being sent—"Wauchope not heard of for a fortnight. King Islanders fear worst has happened." Just think of tourists being held up and people being kept in suspense like that. I also could have been out improving my property instead of wasting my time. At one time it was hoped that King Island would develop as a tourist resort, but, owing to experiences like that I have mentioned, the effort failed. Still, a number of pheasant shooters visit the island every year, and I believe many more people would visit the island if they knew that telephone communication existed, and they could keep in touch with their homes or business places. I believe more use would be made of the telephone from King Island to the mainland than from the island to Tasmania. There are times when fat cattle are worth more in Tasmania, and are sent there. In most cases, however, it is found more profitable to send them to Victoria. Pigs and other stock also sometimes go to Victoria. As for butter, Melbourne is the natural port of shipment for export. I do not know of any firms having a business in Melbourne and a representative at King Island, excepting perhaps firms handling livestock. I have here a number of statements made by representative citizens of King Island which I have been asked to submit on their behalf:—

Thomas Graham, managing director K. I. Co-operative Company Limited, states:—

The development of King Island is retarded by its isolation, and telephone communication with the mainland will lessen the isolation, and be a distinct aid to development. King Island has made a great advance in the dairying industry in the last ten years, but to develop it to its full capacity the number of settlers must be largely increased. With the reduced prices for primary production, farmers are turning their attention to the areas of certain rainfall and cheaper land. My prospective settlers are deterred from coming to King Island by isolation, and anything which tends to reduce the isolation will be welcomed. It is almost impossible to estimate the effect on residents here by being able to speak with residents on the mainland, and I believe that telephone communication alone would be the means of bringing a number of good settlers to the island, with a corresponding increase in production, and the increased use of the telephone service. Departmental figures will show the extent to which the island telephone is made use of, and also the revenue obtained from the radio service. I consider the revenue from the submarine telephone will be at least three times that of the present radio. In my own company the telephone will be invaluable, and will be used to a very much greater extent than the radio. The importance of being able to get in direct touch with Melbourne will be of inestimable value to business here. In these days of keen competition, it is essential that we be able to keep in close touch with the markets. A number of people here have children away at school on the mainland, and from this there could be a constant source of revenue. Tourist traffic would also be stimulated. Many Melbourne business people would come to King Island for a quiet holiday, only for the fact of its isolation. If the telephone were available a great number would come here. In my opinion the telephone trade would, from the outset, be a big source of revenue, and the possibilities of development are so great that the revenue would be increased three or four fold within a few years.

R. H. Hooper, president Returned Sailors' and Soldiers' Imperial League of Australia (King Island Branch), states:—

I consider the service justified in view of isolation. I remember the time when there was no telephone and no communication with outside world for many days, and even weeks at a time. Now, subscribers to phone number 150, and we have a part-time radio service. Cable would be means of discussing various soldier matters and business generally with Claver Settlement Board at headquarters. On one occasion soldiers subscribed £250 to send deputation to Hobart to discuss matters of importance to members of this sub-branch. Boat service and mails so erratic owing to vagaries of weather that King Island people would frequently take advantage of cable service. Many advantages that exist in larger centres are lacking here, and any means of lessening our acute isolation should be encouraged if possible. No railways or transport facilities beyond good roads; chances of education and social advantages all curtailed by means of our isolation. Telephone conversation far more advantageous than radio message and cheaper. Many residents have relations on mainland, and I suggest that frequent conversations would be looked in this manner. Speaking from a medical point of view, there are cases where our medical officer desires to discuss cases with specialists and others on the mainland. This could be done by telephone, but not by radio. One case in point: The present committee were unable to come over to obtain evidence; the information required could have been supplied by telephone promptly and fully.

J. J. Brown, manager, K.I. Co-operative Dairy Factory Limited, states:—

I have pleasure in submitting to you figures, as evidence in connexion with the establishment of a telephone service between Tasmania and Victoria, and connecting with King Island. I have submitted the figures for the past three years, and it will be seen that the amount of production is showing a marked increase each year. The number of suppliers to the factory is 72, and, in addition, there are various dairymen who manufacture and ship their own butter. I have no hesitation in stating that should the proposed telephone service be established and connected with King Island, the butter and other industries here would prove the justification of the expenditure necessary, as the telephone would be used extensively in preference to the radio in communicating with Tasmania and Victoria. The following figures show the butter manufactured by the above company during the past three seasons:—

1926-1929	204 tons 4 cwt. 2 qrs. 17 lb.
1929-1930	283 tons 7 cwt. 1 qr. 17 lb.
1930-1931	316 tons (estimated).

The amount of £95,490 8s. 2d. was paid to suppliers during the past two years and eight months. The estimated figures shown above for 1930-1931 are based on the fact that to the end of December, 1930, an amount of 263 tons 11 cwt. 0 qrs. 7 lb. of butter was manufactured, and by making the figures for the following four months (the end of the dairying season) correspond with the last four months of the previous season the result would be as given. This is, of course, a low estimate when the figures are compared with the eight months already completed.

Harrison Brothers, butchers, bakers, and graziers, state:—

The proposed telephone service with the mainland, this would be of great benefit to us, especially when mail fails to leave the island owing to the boats not calling. We import a lot of goods from the mainland, and this would help us a great deal in keeping our stocks more regular. We feel sure all business people here would welcome it. It would also enable any one to take better advantage of the market fluctuations. We hope to see the telephone service an established fact.

H. V. Hardy, grazier, states:—

The proposed telephone service connecting King Island with Victoria and Tasmania would, in my opinion, be very beneficial to King Island, which suffers much from isolation, and I would as yet business here to a very large extent, and should be availed of more fully when people become familiar with such a simple and direct method of transacting business. The service being continuous would fill the gap left by the time limit of the radio service; also business done by personal conversation is more satisfactory than an exchange of wire.

Mrs. E. Warren, hotel proprietress, states:—

In my opinion cable telephone communication with the world is important and it will be possible to talk not only with Tasmania and other States, but with other countries. It will be a distinct advantage to all King Island residents. From a business point of view it will be the means of solving many of our present difficulties, as on account of our mountainous service, orders have to be duplicated constantly by radio, which

also has its disadvantages, being costly for one thing and devoid of detail for another. Invariably it takes ten days to get an answer to a letter; then, if that is not a satisfactory one, another ten days must elapse before anything final can be arrived at. A telephone service would eliminate all such happenings as this, and speed up business. I could not estimate the number of calls, but can say definitely we will use it in our business and in a personal way.

E. Johnstone, dairy farmer, states:—

The advantages of the telephone service as suggested would, in my opinion, reduce our isolation, would be a big assistance towards increased production, and will be an inducement to new settlers to come here. King Island can be made one of the most prosperous dairying districts in the Commonwealth. It has a ten months' season, and the cheapest land in Australia. The telephone would be of great assistance in keeping many young people on the island instead of going to cities, as the social life would be improved. The absentee land-owner will be encouraged to have his block worked, as he will be able to give instructions from his city home.

C. R. Long, shipping agent for W. Holyman & Sons, states:—

We would be in much closer touch with the shipping world if we had the telephone. It would be of great assistance by enabling us to get more reliable information as to the movements of shipping, and getting it immediately instead of waiting for hours, as sometimes happens now. Orders that do not go on account of boat missing could be given over the telephone and goods shipped by next boat coming back; this would be of great benefit to business people. The telephone would be most useful in that we would have a continuous service, and not part time as with radio.

J. H. Curtin, manager, Mutual Store, states:—

The telephone would be of great benefit from a business point of view. It happens that orders have to be sent by telegram. This is not satisfactory, as sufficient information cannot be given in telegram; matters could be arranged satisfactorily by telephone. If telephone were available more business would be done by us by telephone than is now done by radio.

E. J. Bertram, grazier and councillor, states:—

Mr. Bruce in evidence stated that tourist trade is practically negligible, also that King Island is out of the way. We do not consider that we are out of the way, being on the direct route between Victoria and Tasmania. There is a possibility of developing tourist traffic, or developing the place into a holiday resort. One of our chief attractions, and known to sportsmen, is pheasant shooting. Although at present the season is only open for two months, there have been on occasions up to 50 sportsmen from Victoria and Tasmania during the season. These men, I consider, would make considerable use of the telephone if available. The population of the island is estimated at approximately 1,200. Taking a conservative estimate of passengers travelling to and from the island at 25 weekly, there are 1,200 travellers between King Island and Victoria and Tasmania each year. Most persons travelling on the King Island boat need, owing to uncertain times of departure and arrival, to acquaint friends and relatives as well as business people. The telephone would be the best means of meeting their requirements.

A. Bertram, auctioneer and grazier, states:—

The telephone would be of considerable benefit to my business. I estimate that business would be increased five times if telephone were installed over the amount of business now done by radio by me. It would be of assistance in future development of the island, and residents would be practically in line with country towns within 50 to 40 miles of Melbourne; this would have a wonderful effect on business.

P. C. Clemons, grazier, also chairman of directors of Butter Factory, states:—

The telephone service if installed would be the means whereby shippers could regulate cattle market, both to the advantage of shippers on the island and to consumers in Tasmania.

Dr. Lincoln, the only medical practitioner on the island, states:—

From a medical point of view and from patient's point of view, I think that a more direct means of communication with the mainland is a vital necessity. I will illustrate a case. A patient was admitted to hospital; I diagnosed the case as acute appendicitis. The reply that I received from the patient and relatives was that she had already been operated on for appendicitis. I realized that probably I had made a mistake, and it was necessary to get in touch with the doctor who had performed the previous operation. After a lot of delay over the wireless a reply was eventually received that appendix had not been removed. Approximately two days elapsed before I received a definite reply. This sufficiently illustrates the necessity for a more direct means of communication. It

is necessary that one doctor should sometimes have a consultation with another doctor to avert direct serious consequences. Would not have to use telephone very often for that purpose, but when need does arise—and it has arisen—it is to avert a probable disaster.

160. To Mr. Long.—I am not a resident of King Island, but have been backward and forward at intervals for the past twenty years. I have been all over the island, and am interested in it, as I have some property there. I have no information as to the relative efficiency of a radio telephone as against a submarine cable, or the costs of some. I think that is a matter more for the expert. The little information that I have is to the effect that radio telephone is uncertain, and that at times during the day it cannot be relied upon to the same extent as a cable connexion. If that is so, it appears to me that the cable would be the better proposition. It devolves, however, into a question of costs. The present system of communication is a radio telegraph and a purely local telephone service. The radio is the only means of communication with outside sources, and is not a continuous service, but operates during the hours of 9 a.m. to 6 p.m. It is, of course, a wonderful improvement on the old mail service, and is regarded as a blessing to those on the island. It is satisfactory as far as it goes, but I think the existence of a telephone would be of greater advantage. The total population of King Island is about 1,200. I believe it is contended that if the trunk telephone were installed the number of telephone subscribers would be increased threefold. With the establishment of a more satisfactory means of communication tending to the greater development of the island, I do not fear the number of settlers being increased to such an extent as to lead to a danger of over-loading. There is room for a great many more settlers yet. In regard to the butter and cheese factories, the butter factory is purely co-operative. The cheese factory may be regarded as a proprietary factory. It belongs to people who have a large area of strawberry clover country with a number of share dairyman on it. Messrs. Holland and Haines use the milk from their own dairies for their cheese-making. There are also private cheese-making establishments. Some people who live in the more isolated parts, send away butter on their own account. A better system of communication would be a distinct advantage to all of them. In regard to tourists the existence of telephone communication would be an inducement for them to visit the island, as many people do not like to go away from home or business without being in a position to communicate as required. Much as I like the island, I would hesitate to go there on account of the difficulty of getting in touch with my family while away. It is very difficult to say to what extent the primary industries might be benefited by the establishment of satisfactory communication, but, generally, I would say that settlement could be increased threefold, and development perhaps many times that. There are properties taken up for which the owners pay rates and land tax and never go near the place. That portion of the country is wholly undeveloped. There are other places doing a little, but are not developed to one-tenth of their possibilities. Then you have other places that appear to be in full profit, but I maintain that they could be more fully improved. Take the place I referred to where good strawberry clover flats exist. Although doing well at present, I consider that with subdivision of pastures, &c., there is still room for improvement. Drainage could be extended, they could get rid of muskeg and that sort of thing. As a matter of fact, on the present population I think the place could be developed to three times the extent it is now. Shipping facilities are quite good enough, only they suffer from interference by the weather. The *Tombac* calls at irregular intervals when fat stock is available, and sometimes also the

Collaboi, but the *Merravat* is the only regular service we have. Even that boat, when the easterly winds are strong, is obliged to pass Naracoopa, and, on such occasions, telephone communication would be very useful. I would not like to say that the shipping facilities are not reliable; the people on the island get all that is possible under the circumstances. If there were more people, I am confident shipping facilities would improve.

161. *To Mr. Gregory*.—As regards harbour facilities, we have on the west coast Currie Harbour, but the entrance will permit only boats of a certain size and design to get in. There is a rock in the vicinity of the entrance, and efforts are being made to get rid of it, if it were removed, other boats could come in. There is a depth of about 9 feet in the vicinity of the jetty. On the other coast for most of the year boats can come alongside the jetty at Naracoopa, but if there is a strong easterly wind and a heavy sea, it is unthinkable.

The witness withdrew.

Hugh Boyd, Stock and Station Agent, representing Pearson, Rowe, Smith and Co. Pty. Ltd., sworn and examined.

162. *To the Chairman*.—I have heard the evidence given by the previous witness, and would like to have it recorded that I endorse all he has said. We do considerable business with King Island, and have had a full share of the fat stock business for a number of years. Most of the stock is disposed of at Newmarket, Victoria. We have found the lack of telephone communication detrimental to our business interests, and have suffered a lot of delay through having to use the radio telegraph. If a telephone service were established, my firm would probably use it four or five times a week. I have only a general idea of the business done between King Island and the mainland, but I think that the departmental estimate of fourteen telephone calls per day for the first year would not be excessive, and, as the service became better known it should be used more extensively.

163. *To Mr. Cameron*.—We have a representative of our firm on the island in the person of Mr. A. Bertram. We do not conduct business between King Island and Tasmania. Most of the stock comes to Victoria. I have no knowledge of any cattle going from the mainland to King Island, but we have sent store sheep to King Island. We use the radio to keep clients informed of the state of the market in Victoria, but the messages have necessarily to be much abbreviated. With a telephone one could go more fully into details, and, from our point of view, a telephone would be a cheaper and more satisfactory service.

164. *To Mr. Long*.—Our business transactions are sometimes retarded under present conditions. We feel strongly that it would be a benefit if we were able to communicate personally with our customers at King Island. There are also certain hours when the radio telegraph is not operating. We find that a disadvantage. Improved communication would benefit the island. We would use the telephone in discussing markets and market prospects with Mr. Bertram or any other clients on the island. In the final analysis I think it would be found that the existence of a telephone would tend to help to develop the island.

The witness withdrew.

Cyril Armstrong, Director, Adanson, Strutt & Co. Pty. Ltd., Melbourne, sworn and examined.

165. *To the Chairman*.—I am a resident of Melbourne, but my firm has business relations with King Island. I quite support everything that Mr. Crowe

has said. Once or twice he has mentioned the disabilities that have cropped up in my own office. One of the main troubles is with stock coming forward, and I refer particularly to pigs, of which we handle a great number. We have our methods of marking, branding, &c., and we would welcome the opportunity of ringing up while a sale is in progress. Certain errors crop up occasionally; for instance, we may have advice of a batch of twenty being sent of a certain brand, and we can locate only eighteen. On the other hand we have advice of six of another brand and we have eight. We could send a message on the radio telegraph, but it would be an advantage to check up these differences at once. When consignments of stock are coming forward we would be telephoned a good description, numbers, names of owners, addresses, &c. The radio telegraph is pretty quick, but occasionally we receive advice of consignment only on the day the ship reaches Melbourne. If agents could ring us up as is done in Victoria, we would be in a position to advise friends on the island as to the advisability of sending stock to market. As it is, we have often to wait until it is almost too late to secure space to advise whether the market is advantageous or disadvantageous. If a telephone existed, arrangements could be made for stock to be consigned at the last minute when, without such advice, the opportunity would be lost. The King Islanders would also benefit by the advantage the telephone would offer to their *King Island News*. He would get much fuller information in affairs that interested the island, market reports, variations in prices, &c., which would not be possible with the radio. Generally speaking, it would be an advantage to the people, increase business, and would, I think, induce more people to settle on the island. Our firm would use the telephone at least four times a week regularly, under ordinary circumstances, and there would probably be emergency calls in addition.

166. *To Mr. Long*.—I have not been to King Island, but I base my information on personal conversation with islanders who have been over here. I am satisfied that King Island offers opportunities for further development, and that the existence of telephone facilities would have a tendency to increase that development.

The witness withdrew.

Charles Ernest Naismith, Manager, Victoria Butter Factories Co-operative Company, Melbourne, sworn and examined.

167. *To the Chairman*.—I am a resident of Melbourne, but have paid five visits to King Island, and have been over most parts of it. I have heard the evidence given by Mr. Crowe and I agree with it. My company has been dealing with the King Island Butter Factory for a great many years. It is sometimes necessary that we get into touch with them at a moment's notice, and that is not as practicable with radio telegraph as by telephone. We often desire to send details in regard to manufacture, reports of Government grading, and if this information is sent by letter it sometimes takes as long as a fortnight to get there. A telephone service on that account would be the very best thing from the point of view of the dairying industry. I feel sure it would increase the amount of dairying done, and would help to bring more people to the island. Last year I was held up at King Island for eight days, and I know it would have been of great assistance if I could have got in touch with my home and office. Under present circumstances, a business man going to the island must be prepared to spend a fortnight away. It is a serious thing to be out of touch for so long, but if it were possible to communicate by telephone, more business

people would be prepared to take the risk and go. I estimate that my firm would regularly use the telephone on an average of four times per week throughout the year.

168. *To Mr. Gregory.*—As the land at King Island is cheap, I think that if any place offers chances of development it is there. They send all their butter to Melbourne, mainly for export. During the winter, if Tasmania is short, a little may possibly go there, but most of it is exported. The island produces about 300 tons of butter a year, and the business is growing every year.

169. *To Mr. Cameron.*—I have visited King Island for business reasons, but it offers many attractions for tourists. It is close to Melbourne, has an ideal climate, and I feel certain that more visitors would go there, especially business people, if they felt they would not be so much out of touch, but could, if necessary, communicate with Victoria or Tasmania. From the point of view of the sportsman the main attraction is fishing and pheasant shooting.

(Taken at Canberra.)

FRIDAY, 29th MARCH, 1931.

Present:

Mr. LACEY, Chairman;

Senator Reid	Mr. Laszarini
Senator Swapeon	Mr. Long
Mr. H. Cameron	Mr. Tully.
Mr. Gregory	

Harry Percy Brown, Director-General of Posts and Telegraphs, recalled and further examined.

170. *To the Chairman.*—I have seen the correspondence with Mr. Fisk regarding the proposal to establish radio-telephonic communication with Tasmania, and have analysed the figures therein. I wish to emphasize that, in the view of the department, there is no likelihood of a single radio channel working twelve hours a day, having a carrying capacity of 100 calls a day. Our experience of circuits which are stable and highly efficient is that there is little expectation of a radio channel giving more than 50 effective calls a day—that is the equivalent of 75 speech period units of three minutes each. The incidence of traffic is a matter of extreme importance. It is impossible to distribute the traffic evenly over every minute of the day. The time occupied in effecting communications over a radio channel is very much greater than over an ordinary metallic circuit. There is the further difficulty that the uniformity of speech transmission with a radio service is nothing like what it is on a physical system. We hold the view that, right from the outset, a minimum of two radio channels would be needed to cater for the traffic for the first two years. That presupposes the realization of the volume of business estimated by the department, and omits any traffic from King Island. I desire to refer to the figures given by Mr. Fisk in reply to question (6) asked by the committee, in which Mr. Fisk says that the total annual charges for a service of twelve hours a day, designed to carry 100 calls per day, would be £11,570 for the fixed charge, and an hourly rate of 30s. In order to obtain the annual charges for a 24-hour service, we should have to add £6,570, representing twelve hours at 30s., which would give a total of £18,140. When the department invited tenders for the

operation of this service some time ago, the figures forwarded by the company were £8,156 and £12,258 respectively. There is one difference which must be borne in mind—in the proposal submitted now by the company provision is made for a telephone order wire. That may account for some of the difference. The company's figure for the annual cost of a twelve-hour service is not complete, because it is necessary to add £2,200 for maintenance and the staffing of technical operators' positions. That brings the total to £14,842. It is interesting to note that, on the basis of 30s. an hour for additional use of the service, £547 10s. per annum per hour increase would be incurred. That sum ignores any additional cost which the department might incur in the operation of the technical equipment. If the service is to be run on a 24-hour basis, the cost, on Mr. Fisk's own figures, would be £12,737, plus twelve hours at 30s. per hour—£3,570—giving a total of £19,307. To that figure must be added the cost of providing staff for the operation and maintenance of the terminal equipment in the trunk exchange, estimated at £3,110, a grand total of £22,477. That figure is comparable with the department's estimate of £18,840 given originally to the committee in respect of stations operated by the department. If two channels were made available for twelve hours a day, the cost would be as shown in the second portion of the reply to question (h), namely £18,132, to which must be added operating and maintenance cost in connexion with the terminal equipment, £4,393, a total of £22,578. In reply to questions by the committee, the company stated that a fixed charge of £2,500 per annum for a period of ten years, would be made for the second channel. That is an important point, because, if the services of a second station were needed for only five years, we should have to pay for a further five years at £2,500 per annum. I direct attention, also, to the revenue and cost aspect of a wireless service based on the figures before us. If a single radio channel were provided, giving a 24-hour service, and if we assume that there would be a full realization of the department's estimate of traffic, namely, 75 speech periods a day for 291 days a year—the standard basis for estimating telephone traffic—the cost for each unit call, omitting the ordinary operations in the trunk exchange, but including the terminal operation, would be £1 0s. 7d., while the average return would be 3s. 3d. per call. That means a loss to the department of 17s. 4d. on each unit call that is established. If we take the costs which have to be borne by the department in paying for the company's service, the amount would be 16s. 7d. for each unit call established. It might be interesting to consider the question in a more concrete form. I have here some figures based on the assumption that a single radio channel service will be available for 24 hours daily, and that the volume of traffic would be at least 75 speech periods per day. I also propose to make a comparison with a cable service. In this connexion it is assumed that there will be a realization of the volume of traffic shown in the schedule previously presented to the committee. The comparison is set out in the following table:—

	£ on cable (based on 24 hours daily)	£ on Cable Service.	Reduction in cost by 24 hr. service of R.M.S.
1932	15,947	9,977	5,970
1933	15,947	8,121	7,826
1934	15,947	6,917	9,030
1935	15,947	5,837	10,110
1936	15,947	4,743	11,204
Total—five years	64,735	35,615	29,120

171. *To Senator Simpson.*—The loss on the radio service is static, because it is impossible to increase the load. We have taken the volume of traffic which we believe the radio service is capable of carrying, not the 100 calls estimated by the company.

172. *To the Chairman.*—The figures take into account cable depreciation. The point is that a radio service cannot possibly carry the business that would offer even at the outset, and that it is expensive to operate. The construction of a radio station is not the beginning and end of the matter. The cost of the terminal equipment and of the lines for effecting connection between the radio station and the telephone network is considerable, while the attention necessary in the case of each call is a serious matter. If the committee is interested in this phase of the subject, I suggest that it visit the Sydney trunk exchange and see the work necessary in effecting communication with the radio service to the United Kingdom. The conditions are identical with those which would be necessary in the case of a radio service to Tasmania. A good deal of costly work, which has to be done in order to establish a call, is eliminated in the case of a cable service. Where there is a reasonable volume of traffic, and the distance between the terminal points is short, wireless is out of the question if it is desired to connect the service with a telephone network at both ends. Wireless is satisfactory for long-distance communication, as between Australia and the United Kingdom, but for short distances it is uneconomical. The position is worse where the radio system is connected with the telephone network at both ends. Indeed, where the two telephone networks are separated by only a comparatively short distance, and the traffic is considerable, it is hopeless to attempt to handle it by radio. On the assumption that within five years the number of calls would be 170 daily, the service would have to provide for 264 speech periods. That would require four radio channels. That would not mean, however, that the loss each year on a single channel service, namely £91,733, would have to be multiplied by four, because the cost does not rise in direct proportion to the number of channels. If we examine the tender of the company, we shall see that it offers a second channel for £2,500 a year, plus 16s. an hour for operating it. That is lower than the cost of an initial service. I do not know what the figure would be if four channels were required. It must be remembered that even for a second channel the company wants a contract for ten years.

173. *To Mr. Cameron.*—At the Sydney station the committee would see the work necessary in effecting calls with the United Kingdom. They would see the amplifying equipment used to regulate the quality of the speech, as well as the arrangement for connecting the two-wire system to the four-wire system to avoid echo. The wireless system is a four-wire system. That has to be connected to a two-wire system. When a person speaks from Australia to England, one side—the receiving side—is cut off by a device in the terminal equipment. When the person in England speaks in reply, the process is reversed—the Australian transmitter is cut off and the receiver in Australia is operated. That apparatus functions spontaneously on the impulse of current which the first syllable uttered into the telephone sets in motion. The mechanism is complicated and considerable technical skill is needed to maintain it in good order. Indeed, so technical is the work that, for a long time, we had two highly-trained engineers on the job. They trained a number of workmen, who are now capable of attending to this work. These men have to be particularly smart. A radio conversation requires more than the mere provision of transmitters and receivers. For that reason the number of calls possible under a radio system is cut down as compared with a cable system. The cable

provides greater stability. On every long-distance radio call an experienced, responsible person must be in attendance to aggregate the periods of effective use of the channel, in order to determine what is a reasonable charge to make against the subscriber. A person may use the apparatus for ten minutes, and yet have only three and a half minutes satisfactory conversation. The length of time charged is an important matter when the charges are as high as £6 for a conversation lasting three minutes.

174. *To the Chairman.*—Over a period of ten years the losses on a radio channel would amount to £139,470, whereas the losses on a cable system for the same period would be only £23,179. Moreover, in the ninth year the cable system would be earning a profit of £251. The profit would rise to £8,457 in the fifteenth year. If, at the end of five years, an additional radio channel were established on the lines referred to in the committee's letter, and were operated for twelve hours a day—which would be adequate, seeing that the volume of traffic at night would not require a second channel—the loss for the total ten-year period would be increased to £210,025 as against £35,179 for a cable service. There is also the point that, if the second radio channel came into operation at the end of the fifth year, £2,500 per annum would have to be paid for ten years from that time, in terms of the company's proposal. Thus, at the end of the first ten years, an amount of £12,500 would be due to the company in respect of the unexpired portion of the contract for the second channel. If, at the end of ten years, relief from the contract was sought, that amount would have to be paid. It is more than likely that, at the end of the ten-year period, it would be decided to scrap the radio service. That liability, however, would remain. That would make the loss £222,525 for the period of ten years. If the department entered into such a contract, it would, presumably, have to pay at the rate of 30s. an hour for the hours of service that it ordered. All those hours during which atmospheric conditions might prevent the use of the service would have to be paid for. Moreover, with a radio service supplied by the company the department would have no assets at the end of ten years, excepting those which would be of no value unless the radio service were continued. I refer to the cost of terminal equipment and the line connecting the stations to the exchanges. On the other hand, if a radio service were established by the department, not only would the annual charges be less than under a rental scheme, but the department would also have some assets at the end of the ten-year period. This point is emphasized in the case of a cable service. Apart from the smaller loss incurred in operating a cable service, as compared with a radio service, the department at the end of the ten-year period would have a cable capable of being used for another 30 years without further capital cost, and at the end of the ten years the cable would be making a profit. Especially in these times, matters of this kind must be viewed from the point of view of their effect on the finances of the country. A cable scheme would cost £180,500, according to the estimate submitted to the committee. On that amount interest would have to be paid. That interest would be considerably less than the annual charges which would have to be paid to the company for a radio service. I believe that a cable system could be supplied on the deferred payment basis. That would mean that we could acquire a cable at an annual cost much less than that required to provide a radio service. In my opinion, some of the firms which tender for this class of work would be willing to arrange the necessary financial accumulation. Of the £180,500 which the cable scheme would cost, work which would have to be done by a contractor would represent £158,800. The rental of a radio service operating one channel for 24 hours a

day would be £22,240 per annum. That sum would provide the interest on the cost of a cable, and also pay off some of the principal. The supply of services on terms is a common practice even on the part of governments. I do not think that the department's estimated cost would need to be increased in such circumstances, as the competition for this class of work is very keen. Of course, the only likely tenderers would be overseas firms; but I do not anticipate any difficulty in the matter of finance.

175. *To Mr. Cameron.*—The terms would be a matter of arrangement with the tenderers. My idea in making this suggestion is to have the heavy losses and to provide a service which would be more satisfactory right from the beginning, as well as leave an asset at the end of the ten-year period.

176. *To Mr. Tully.*—Roughly, the position is that the accumulated loss on a radio service over a period of ten years would be £229,000. The cost of the cable is estimated at £180,000, or £10,000 less. Interest on the cost of the cable would be about £0,000 per annum, as against an annual cost of £22,000 on a radio service, leaving a substantial balance for paying off the cost of the cable. In twelve years that would nearly amount to the cost of the cable. In any case, there is no comparison between the two services. Radio is extremely valuable; but it has its distinct limitations. It is not suitable for a service of this character.

177. *To the Chairman.*—Apart from the question of cost, I still regard it as objectionable that a second party should be concerned in the operation of this service. In my opinion, it is not sound practice to introduce more than one authority into the operation of a unified communication service. No one would think of doing so if it could be avoided. Experience has shown that such divided control is most undesirable. In Great Britain they had the Post Office and the National Telephone Company both dealing with communications. The position is the same as where the completion of a big undertaking depends on co-ordination between two or three authorities acting under separate control. It is quite different from a job undertaken by one authority. When I speak of 100 calls a day, I do not necessarily mean 50 each way. The service would be flexible; it could be 50 each way, or 70 one way and 30 the other, or all in one direction. Radio messages cannot be sent from Melbourne to Tasmania and from Tasmania to Melbourne simultaneously on a one channel service. Two persons at one end could not talk simultaneously to two persons at the other end in separate conversations over a single channel service. There is no Australian firm which manufactures submarine cable; but, with the exception of valves, most of the radio equipment could be made in Australia. Should a cable be decided on, the firm which manufactured the cable would probably get the contract for laying it. That would be the most economical way of providing a service. The company is emphatic that it would not expect to receive any proportion of the revenue earned if a radio service

between Australia and Tasmania were provided. The company's letter shows clearly that the company wishes to be guaranteed against loss. For that reason it stipulates a certain amount to be paid per annum as rental for the service, and a further amount for each hour the service is made available. The experience of the department clearly indicates that not more than 75 speech periods per day could be anticipated on a radio service.

178. *To Mr. Gregory.*—I do not think there is any prospect of arranging for a radio service for five years, giving the company the right to the whole of the proceeds, and some small compensation at the end of the period, because for the first five years it is estimated that the service would be run at a loss. In any case, the department would have to put in the terminal equipment, which would probably cost from £8,000 to £10,000. As a purely business proposition, the only satisfactory service would be a cable service. The table I have submitted shows the estimated losses of a cable service and of a one-channel radio service. I cannot imagine that a company, even for publicity purposes or in order to maintain its prestige, would incur heavy losses in order to establish a radio service. A provision in a contract requiring a plant capable of handling 100 calls a day, would not be a satisfactory safeguard. The company's answer to question (b), already referred to, provides for a service "of twelve hours a day, designed to carry 100 calls a day." There are factors other than design. We can only go on our experience with land-line circuits as to what may reasonably be expected.

179. *To Senator Field.*—Even if a company were prepared to finance the installation of a cable, I do not advocate going ahead with the work immediately. Tasmania has done without this service for a long time, and in the circumstances would probably be disposed to wait a few years more if it were certain that a satisfactory service would then be made available. I do not mean that we should wait until prosperity has returned; when it was evident that the financial clouds were lifting it would be reasonable to take a risk and establish the service. These are not the days when we ought to spend large sums of money unless we can see that they will give substantial returns both directly and indirectly, and improve the national prosperity. It is very unlikely that the cost of installing a cable service will become less than it is to-day. The price of metal is now very low compared with a few years ago, when copper was £120 a ton. It is probable that the cost of radio equipment will fall slightly; but, in the case of a radio service, the capital investment is not so serious a factor as are the operating and maintenance costs.

180. *To Mr. Cameron.*—In the interests of all sections, including Tasmania, I think it would be better to wait until a cable service can be provided rather than have a radio service now.