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COMMONWEALTH OF AUSTRALIA.

Clerk of the Senate.

286/21

PARLIAMENTARY STANDING COMMITTEE
ON PUBLIC WORKS.

REPORT

1921.

SEAS
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TOGETHER WITH

Minutes of Evidence

MINUTES OF EVIDENCE

RELATING TO THE PROPOSED

ERECTION OF TELEPHONE TRUNK LINE
BETWEEN BRISBANE AND SYDNEY.

PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

MEMBERS OF THE PARLIAMENTARY STANDING COMMITTEE ON PUBLIC WORKS.

Third Committee.

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

Senate.

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

House of Representatives.

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

* Appointed 26th July, 1920.

† Resigned 22nd July, 1920.

† Re-appointed 26th July, 1920.

†† Ousted to be a member of the House, 20th June, 1920.

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EXTRACT FROM THE VOTES AND PROCEEDINGS OF THE HOUSE OF REPRESENTATIVES.

No. 109 OF 19TH NOVEMBER, 1920.

10. PUBLIC WORKS COMMITTEE.—REFERENCE OF WORK.—TELEPHONE TRUNK LINE BETWEEN BRISBANE AND SYDNEY.—
Mr. Wise moved, pursuant to notice, That, in accordance with the provisions of the *Commonwealth Public Works Committee Act 1913-1914*, the following work be referred to the Parliamentary Standing Committee on Public Works for their report thereon, viz.:—Erection of a telephone trunk line between Brisbane and Sydney.
Debate ensued.
Question—put and passed.

ERECTION OF TELEPHONE TRUNK LINE BETWEEN BRISBANE AND SYDNEY.

REPORT.

The Parliamentary Standing Committee on Public Works, to which the House of Representatives referred for report the question of the erection of a Telephone Trunk Line between Brisbane and Sydney, has the honour to report as follows:—

PROPOSAL.

1. Representations having been made from time to time by the Chambers of Commerce and certain members of the business public of Sydney and Brisbane that telephone communication should be established between those two cities, the Postmaster-General's Department has submitted a proposal to carry this into effect.

ESTIMATED COST.

2. The length of the line proposed is about 700 miles, and the estimated cost is set down at—

Wire	£16,247
Material	4,193
Labour	8,300
Incidentals	3,795
Administration charges	2,665
	£35,200

COMMITTEE'S INVESTIGATIONS.

3. In the course of its inquiries, the Committee ascertained that a telephone line was erected in 1916 between Brisbane and Wallangarra with a view to its ultimate continuation to Sydney, but the war and the consequent financial stringency interfered with the proposal. It was, at that time, intended to use the line for intermediate stations, as well as for a through service, and the weight of the wire on that section is 400 lbs. to the mile. Under the present proposal, it is intended to connect this 400 lbs. wire to a 200 lbs. wire, to be erected between Wallangarra and Sydney, and so form the through trunk line, and to provide for the service now being given between Brisbane and Wallangarra by the erection of lighter lines upon that section.

4. *Estimated Revenue.*—The revenue expected to be derived from this telephone trunk line is estimated at £2,550 for the first year, rising to £5,100 in the second year.

5. *Financial Aspect.*—In submitting the proposal, the departmental officers stated that the annual charges against the line would be as follows:—

Interest on capital	£1,760
Maintenance	1,222
Administration	320
Operating	218
Total	£3,520
Deducting the estimated revenue of	2,550
It was anticipated that the loss on the first year would be	£970

The Committee, however, ascertained that, in estimating the cost of this line, the price of copper wire was taken at £168 per ton. Since the estimate was prepared, the price of copper has fallen, and it is now anticipated that the necessary copper wire will be obtained at about £130 per ton, which would reduce the estimated cost by about £3,686. Under these circumstances the estimated cost of the proposal would be £31,514 and the annual charges 3,151 so that if the first year's revenue reaches 2,550 the loss for the first year will be only 601

COMMITTEE'S RECOMMENDATION.

After due consideration of the matter, the Committee is of opinion that the Telephone Trunk Line should be erected as proposed, and recommends accordingly

H. Gregory
H. GREGORY,
Chairman.

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

MINUTES OF EVIDENCE.

(Taken at Melbourne.)

TUESDAY, 23rd NOVEMBER, 1920.

Present:

Mr. GREGORY, Chairman;	
Senator Foll,	Mr. Mackay,
Senator Newland,	Mr. Mathews,
Mr. Atkinson,	Mr. Parker Moloney.
Mr. Bamford,	

Frederick Golding, Chief Electrical Engineer and Director of Radi. Services, sworn and examined.

1. To the Chairman.—The proposal in connexion with the Sydney-Brisbane trunk line reference is to erect a telephone trunk line between those two cities in order to provide telephonic communication. Representations have been made from time to time by Chambers of Commerce and certain members of the business public in both Sydney and Brisbane for telephonic communication to be established. So far as the Department is concerned, it is considered desirable that such a line should be provided, and there is no doubt that the line would have been provided in the past had the financial position allowed, and had material been available. The estimated cost of the work is £35,200. It is estimated that the revenue to be derived from this line during the first year will be £2,550, but in the second year the revenue is anticipated to increase by 100 per cent.; that is to say, to £5,100. The estimated cost of the line is £35,200. Working expenses, including interest and operating costs, are estimated at £3,520. The total revenue required, therefore, to make the line financial will be £3,520. Estimated revenue for the first year is £2,550, so that the deficit for the first year is estimated to be £970. During the second and subsequent years, however, this deficit is anticipated to be converted into a surplus of £1,550. This surplus is brought about by the fact that the revenue is anticipated to increase from £2,550 to £5,100. The erection of the line, therefore, is considered from the financial point of view also to be justified. The distance is about 700 miles. The construction will be with 200-lb. copper wire. That will be the same weight as in the case of the Sydney-Melbourne trunk line. The cost of the wire for the New South Wales portion will be £13,880, and for the Queensland portion £2,387; total, £16,267. That will be for wire alone. The wire and material will be—New South Wales, £16,360; for Queensland, £4,980; total, £20,440. Labour for the New South Wales portion will be £3,900, and for the Queensland portion £4,400—a total of £8,300. Incidental expenses in New South Wales will amount to £1,200, and in Queensland to £1,895; total, £3,795. Administration charges will be—New South Wales, £1,540; Queensland, £1,196; total, £2,665; grand total, £35,200. Certain alterations and renewals are required in Queensland, which will make the labour cost there higher than in New South Wales, although the Queensland distance will be very much shorter. In the working costs we have taken the 10 per cent. basis. The estimated cost, as I have just pointed out, is £35,200, and 10 per cent. upon that will be £3,520. I have apportioned the figures—Interest on capital, at

5 per cent., £1,760; maintenance, £1,222; administration, £320; and operating, £218. It is not proposed to use this line for dual purposes, merely because it is not required. Therefore, the interest on capital set down to telephone trunk line will be the total amount of interest. The revenue upon this line has been estimated by the Traffic Managers in Sydney and Brisbane, together with the inquiries made of merchants in those cities.

2. To Mr. Mackay.—The Brisbane-Wallangarra line was constructed some time ago with a view to its ultimate continuation to Sydney, but the war and the consequent financial stringency interfered with that proposal. It was at that time intended to use the line for intermediate stations as well as for a through service. The weight of the wire upon that section is 400-lb. copper wire. It is intended to connect the light 200-lb. wire with this heavier wire, and to provide for the service now being given between Brisbane and Wallangarra by the erection of lighter wires upon that section.

3. To Senator Foll.—It is necessary to follow the railway line, for the chief reason that it reduces our maintenance charges and cuts out delay should a breakdown occur. It also provides an opportunity for those railway towns, such as Warwick and Toowoomba, to secure direct communication with Sydney and Brisbane upon this trunk line. If the trunk line were constructed along some other route, and a shorter one than that which is proposed, it would still be possible for these places to communicate with Sydney through Brisbane, but there would be apt to be delay, in breakdowns, and the cost of maintenance would be very much more. It is rather difficult to estimate telephone revenue to a place which has not previously had direct connexion. Previously our estimates of revenue, which we secured from our Postal Inspectors and Telephone Department Managers, did not warrant the construction of this line.

4. To Mr. Mathews.—When the trunk telephone line was introduced between Melbourne and Sydney it did not cause much reduction in the telegraphic service, and we do not anticipate a reduction of telegraphic communication between Sydney and Brisbane as an outcome of this installation. We find always that the greater the service we give, the more freely that service is availed of. There will be two sets of repeaters upon this proposed line.

5. To Mr. Mackay.—With regard to the question of fee, my own opinion is that the charge should be 7s. 6d. Our estimates were not based upon that calculation, however. The fee for trunk line telephone communication between Adelaide and Melbourne is 4s. 10d. I have already pointed out that our charges here are lower than in any other part of the world. The estimates which I have given are the estimates of the Sydney and Brisbane Telephone Managers, in consultation with the principal inspectors. They are not my estimates. I am not in a position to say what the revenue should be. The figures, however, are reviewed by me. The estimates of revenue were based upon a charge of 5s. 8d. per call during ordinary hours, and 2s. 10d. per call between the hours of 7 p.m. and 8 a.m. Double rates on Sunday and on Good Friday.

(Taken at Sydney.)

WEDNESDAY, 15TH DECEMBER, 1920.

Present:

Mr. GREGORY, Chairman;

Senator Foll,

Mr. Bamford,

Senator Newland,

Mr. Mathews,

Mr. Atkinson,

Mr. Parker Moloney.

John Murray Crawford, State Engineer, Postmaster-General's Department, New South Wales.

6. To the Chairman.—The technical evidence I have given in connexion with the proposal to duplicate the Sydney-Melbourne trunk telephone line applies equally to the project for the erection of a trunk telephone line between Sydney and Brisbane. In this instance, also, we propose to use 200-lb. copper wire. The total distance is 695 miles, of which 492 miles is in New South Wales. The cost of the wire, arms, spindles, and associated material to be used in this State is estimated at £10,500, based on a price of £168 per ton for the wire. The labour is estimated at £3,600, incidental expenditure at £1,100, and apparatus £500, making a total of £23,500. Electrolytic copper has 100 per cent. of conductivity, and the hard-drawn copper wire which is used by the Department has greater tensile strength than ordinary copper. The practice throughout the world is to use electrolytic copper for telephone wires. In connexion with departmental works, State boundaries are closely observed except in special cases.

7. To Senator Foll.—It is proposed to duplicate the Melbourne-Sydney line before constructing a new trunk line to Brisbane. The former work was placed on the estimates last year because the data held by the Department showed the urgency of additional means of communication between Melbourne and Sydney, whereas we have no definite data, except letters from chambers of commerce and business firms, as to the necessity for a line between Sydney and Brisbane. We have not sufficient material in hand to enable us to construct the two lines simultaneously. In deciding upon the order in which new works shall be carried out, the Department is influenced by the necessity, as indicated by the estimates of revenue.

8. To Mr. Parker Moloney.—There will probably be two repeating stations between Sydney and Brisbane—one about Tamworth, and the other at Tenterfield—but that has not yet been definitely settled.

(Taken at Brisbane.)

MONDAY, 7TH MARCH, 1921.

Present:

Senator NEWLAND, in the Chair;

Senator Foll,

Mr. Mackay,

Senator Plain,

Mr. Mathews,

Mr. Atkinson,

Mr. Parker Moloney.

Mr. Bamford,

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

9. To Senator Newland.—I consider the erection of a trunk line telephone between Brisbane and Sydney is desirable, and will be remunerative. If we may judge by the telephone trunk lines Intra-State, we are quite safe in assuming that there will be big business on a trunk line between Brisbane and Sydney. Every time we open up a new trunk line in Queensland a big revenue follows. A trunk line telephone is something like

a motor car, in that it annihilates space. Our experience in Queensland is that trunk lines are always a safe investment; their establishment immediately produces business. In the first place, the reason for the proposal is that it is a modern development in providing facilities. The public have such facilities between Melbourne and Sydney and Melbourne and Adelaide. Both those lines have proved remunerative. In these days people are not satisfied with only telegraphic communication. If there is an urgent matter to be attended to they will pay almost any price to get into touch and to be able to settle their business promptly. In Queensland we have trunk lines in almost every direction. Estimates prepared beforehand indicated in many cases that they might not be a profitable investment, but results have proved otherwise. It is possible now to communicate by telephone between Longreach and Wallangarra, a distance of something like 1,200 miles. We have a number of telegraph circuits between Brisbane and Sydney, and an over-pressure of telegraphic business rarely occurs. Every additional telephone-trunk line necessarily interferes, but not to an appreciable extent, with the telegraph revenue. My experience is that trunk line telephone working is an addendum to telegraph working. The one is an addendum to the other. They are correlated in that both produce business. The charges on an Inter-State trunk line telephone are much higher than the telegraphic charges, but in a three-minute conversation over the telephone a man can say more than could be put into a dozen telegraph messages, and business can often be finalized very promptly in that way.

10. To Mr. Bamford.—Conversations as a rule can be carried on quite clearly by telephone between Longreach and Wallangarra.

11. To Senator Newland.—I have here a statement dealing with the proposal.

BRISBANE-SYDNEY TELEPHONE CIRCUIT.

Necessity for Line.—To provide similar facilities between Sydney and Brisbane as exist between the southern capitals, Sydney-Melbourne and Melbourne-Adelaide. The line is required for public convenience, and to expedite and facilitate the transaction of urgent business between the two cities. Its necessity has repeatedly been urged by applications made by representative public bodies and also by members of the Federal Parliament.

On the telephone line, Sydney-Melbourne, the total traffic is reported to be 150 calls daily, and on the line, Melbourne-Adelaide, total traffic is reported to be 120 calls daily. It is safe to assume that a direct circuit between Sydney and Brisbane would be as equally popular in comparison as similar lines between the southern capitals.

There is not the business between Brisbane and Sydney that there is between Melbourne and Adelaide.

12. To Mr. Mackay.—Relatively, the Brisbane-Sydney telephone line would be equally successful.

13. To Senator Newland.—We have trunk lines along part of the route at the present time, and the estimated cost of putting the line in a complete state of order between Brisbane and the border is £13,725. Included in the material which will be required is about 16 tons of copper wire, and the estimate was based on a charge of £168 per ton, which was approximately what we were paying for it at that time. Since then there has been a fall, and on present figures there would be a reduction on this account of about £450. The written statement from which I have been quoting continues—

Estimated Cost.—Although there is available between Brisbane and Wallangarra two long copper wires (400 lb. per mile) erected in 1916, as the Queensland section of the Brisbane-Sydney telephone line, these have been used, for telephone business between Queensland stations and also between stations

in the northern portion of New South Wales. The traffic on the line is very heavy, and the line could not carry Inter-State business in addition to the existing local traffic.

14. To Mr. Mathews.—The present heavy copper wire line to Wallangarra will be a portion of the trunk line. We have a 400-lb. copper wire line which we are using for State and Inter-State business as far as Armidale (New South Wales), but we shall have to provide relief circuits to release this line from the loading it now carries. We shall substitute for it a 200-lb. copper wire line to provide for our local requirements, and that, it is estimated, will cost £13,725. The estimated traffic and revenue is dealt with in the following statement:—

Estimated Traffic and Revenue.—In estimating the traffic likely to be carried over the line, this has been calculated on a comparison between the telegraph business between Brisbane and Sydney and the telegraph and telephone business between Sydney and Melbourne. The average daily telegraph business between Sydney and Melbourne is reported to be 1,538, and between Sydney and Brisbane, 1,013; that is, Sydney-Melbourne is to Sydney-Brisbane business as three is to two. The total traffic on the Sydney-Melbourne trunk line is reported as 150 calls daily, and assuming that the telephone business Brisbane-Sydney will bear the same ratio to Sydney-Melbourne as does the telegraph business, the calls daily on the Brisbane-Sydney line would total 100. This is slightly less than the traffic on Melbourne-Adelaide line, which is reported to be 120 daily. It is not likely, however, that a load of 100 calls daily would be reached within the first year, and it is estimated that when the line is opened it would carry approximately forty calls daily, increasing as the facility became better known.

Estimated Revenue.—On the Sydney-Melbourne line approximately 38 per cent. of the calls are made after 7 p.m., when half-rates apply. Estimating similar conditions with business of forty calls daily between Sydney and Brisbane, there would be twenty-five full-rate calls at 5s 8d., and fifteen half-rate calls at 2s. 10d. daily. The revenue would, therefore, be £9 4s. 2d. daily, or £3,361 per annum. This estimate is based on 365 days per annum, for, although the same number of calls would not be handled on Sundays as on week days, the charge is double on Sundays.

It is estimated that the traffic on the line would increase by one-third in the second year, making a total revenue of £4,481. In the fourth year the line should be carrying a load of 100 calls daily, when it would be necessary to duplicate the circuit. The revenue at this time would total £8,377 per annum.

The total length of the circuit between Brisbane and Sydney is 657 miles, namely:—New South Wales, 492; Queensland, 165 miles.

On the assumption that the revenue to be credited to the Queensland portion of the line would be in the same proportion as the mileage of line, namely, 25; this would be—

1st year—Total revenue, £3,361; Queensland portion, £841.
2nd year—Total revenue, £4,481; Queensland portion, £1,125.
4th year—Total revenue, £8,376; Queensland portion, £2,158.

Annual Charges.—The actual cost of erecting the Brisbane-Wallangarra section of the Sydney trunk line was £9,768, and the actual charges are as follows:—

Interest, at 5 per cent. ...	£488 12 0
Sinking fund ...	48 0 0
Maintenance (actual cost) ...	426 0 0
	£962 12 0

The operating costs for the Queensland end of the line for the first year would be £58, increasing to £116 when the line would be carrying the full load. The distance from Brisbane to Sydney is approximately 725 miles. It is not our intention to erect a new line right through. It would be a waste of public money to use 400-lb. copper wire except for a through trunk line. We shall have to construct lines of lighter weight wire to release the 400-lb. copper wire line between Brisbane and Wallangarra from the traffic now carried by it. As a matter of fact, we shall have a 200-lb. wire telephone line from Sydney to Brisbane.

15. To Senator Foll.—The 400-lb. wire line was originally put up because it would provide for a trunk line between Brisbane and Sydney, which had been in the air for a number of years.

16. To Mr. Mathews.—There were no repeaters in those days; we are now using repeaters in this State.

17. To Senator Newland.—The estimated cost of the whole line is £35,200. My estimate of £13,725 relates only to the Queensland portion of the work.

18. To Mr. Atkinson.—In other words, it is estimated that it will cost £13,725 to put up a 200-lb. wire between here and Wallangarra, to relieve the 400-lb. wire now in use. The estimate of £13,725 covers the whole cost of wire and labour. The figures I have given were prepared in Brisbane.

19. To Senator Newland.—The Brisbane Chamber of Commerce has made direct representations to the Central Office as to the need for this trunk line. My experience of the Sydney to Melbourne trunk line leads me to anticipate that there will be a loss in the working of this line for the first year or two. I do not think that there will be at any time on this line the volume of business that there is between Sydney and Melbourne. The conditions are entirely different. Districts along the route will be catered for by an omnibus line. Only the more important offices along the trunk line can be allowed to use it. There must be as few offices as possible connected with the trunk line, and we shall provide for the others by means of an omnibus line, which will serve all intermediate stations. It will be good business to construct a line from Brisbane to Wallangarra simply to release the present 400-lb. copper wire for Inter-State purposes. The offices at Toowoomba and Warwick, amongst others, would be of consequence with the trunk line.

20. To Mr. Mackay.—There is already a big traffic on the line between Brisbane and Wallangarra, as the following table of particulars of the loading of the present circuits between Brisbane and the New South Wales border will show:—

On the 400-lb. copper trunk.—

Section—

Brisbane-Warwick, 95.58 calls daily.
Warwick-Stanthorpe, 63.26 calls daily.
Stanthorpe-Wallangarra, 54.19 calls daily.
Wallangarra-Tenterfield, 65.73 calls daily.
Tenterfield-Glen Innes, 26.28 calls daily.
Glen Innes-Guyra, 8.44 calls daily.
Guyra-Armidale, 7.12 calls daily.

Brisbane-Warwick trunk circuit (200-lb. copper).—

Section—

Brisbane-Ipswich, 91.57 calls daily.
Ipswich-Harrisville, 108.04 calls daily.
Harrisville-Kalbar, 104.06 calls daily.
Kalbar-Warwick, 98.72 calls daily.

* These figures include only the business to and from Queensland stations, and do not include any business entirely between New South Wales stations.

Warwick-Stanthorpe (200-lb. H.D.C. circuit).—
Section—

Warwick-Cherry Gully, 47.77 calls daily.
Cherry Gully-Dalveen, 48.87 calls daily.
Dalveen-Thulimbah, 42.51 calls daily.
Thulimbah-The Summit, 46.84 calls daily.
The Summit-Appelthorpe, 46.66 calls daily.
Appelthorpe-Stanthorpe, 50.36 calls daily.

The concession of half rates after 7 p.m. applies to trunk lines throughout the Commonwealth. I do not think it is a payable proposition. The original idea was that it would lead to the utilization of the lines at times when they were not required for business purposes, but there is no doubt many firms hold over their business messages until after 7 p.m. in order to secure the advantage of the reduced rate. I do not think the reduced rates should apply as early as from 7 p.m. I think 8 p.m. is early enough. I was at Central Office when the trunk line between Sydney and Melbourne was opened, and it was considered at that time that by reducing the rates after 8 p.m.—that was the hour originally fixed—we should obtain revenue at a time when the line would not be used for ordinary business purposes. It will still be necessary to erect a 200-lb. wire line between Brisbane and Wallangarra after the trunk line is completed. The existence of the 400-lb. wire line will add to the efficiency of the service. We cannot carry long distance conversations over a lighter wire unless we have repeaters. We have recently installed repeaters at Bundaberg and elsewhere, and they have been an absolute success. The attention of the Postmaster-General has been drawn to the necessity for this trunk line by Federal members, including Colonel Cameron. The time has arrived when it is reasonable to expect the provision of a trunk line between Sydney and Brisbane. I do not regard it, however, as an urgent matter, and would not put aside in its favour more important and urgent work in the State. After all, it is simply a matter of funds. If the provision of this trunk line would have a tendency to cut down votes required for other purposes of the Department in this State, I should prefer to let it remain in abeyance. The funds on the estimate for country services have been practically exhausted. I do not wish it to be understood that I am opposed to the construction of this trunk line; I think it most desirable that all the capital cities should be connected where the work can be done at a reasonable cost. I do not wish this work to be postponed, but if I had to choose between providing an important service like the proposed Albion automatic exchange or this trunk line, I would stand by the Albion work as being the more urgent and the more important from a revenue point of view. It is a matter of comparison. This trunk line is most desirable if the funds to provide for it can be found without any interference with necessary urgent work.

21. To Senator Foll.—I recognise that the Department is run for the convenience of the people, and I had that in mind when I established a new exchange at Albion. We shall serve a larger number of the people than would be served by the establishment of this trunk line. I repeat that I am in favour of a trunk line between Sydney and Brisbane, but I do not regard it as being such an urgent matter that it should be allowed to interfere with any necessary urgent work. I do not think it would be a better proposition to take the line by way of the northern rivers. We already have our construction along the railway line. It is easier to maintain a line so situated than to maintain one that is away from a railway line. Where our services have been away from a railway line we have found it necessary in many cases to divert them to a railway line, because of the easier and cheaper maintenance. Calls on the trunk line from such places as Ipswich, Toowoomba and Warwick will have to take their turn

on the circuit. Calls this way would be controlled from Sydney, and calls from the other end would be controlled from Brisbane. There is no doubt that an arrangement could be made by which calls from Ipswich, Toowoomba, and other important centres along the line would take their turn in the circuit. Calls will be transmitted in the order in which they are lodged, no matter whether they be lodged here or at Toowoomba, or Sydney. In addition to benefiting Brisbane, this trunk line will benefit country towns along the route. What is more, residents of towns such as Gympie, on the other side, would be able to ring Sydney and Brisbane. It will be quite practicable when this line is completed to speak between Sydney and Rockhampton. In such cases it may be necessary to use repeaters. At the present moment we are only catering for traffic between Sydney and Brisbane. There is no reason why we should not cater for longer distances when the business is not too large. If this proposition is reported on favourably by the Committee, there is no reason why we should not push on with the work at once provided we have the material. We have completed our part of the work by constructing a 400-lb. line to Wallangarra, but with the granting of approval to the scheme we would, of course, proceed with the construction of the light line to relieve the present 400-lb. wire line, and the Department in New South Wales would look after the work on its side of the border. It would take some months to complete the work.

22. To Mr. Parker Moloney.—We have a record of the period of delay in respect of all calls. There are very few cancellations at the present time. There is at present telephonic communication between Sydney and Armidale, but the wires at present in position there would not carry a conversation through to Brisbane.

23. To Mr. Atkinson.—The extension of the line from Wallangarra to Sydney may promote business with New South Wales, but I do not think there is any likelihood of a large increase of business between Brisbane and Sydney and the intermediate centres. There are no commercial transactions between Brisbane and Sydney are nothing like those taking place between Sydney and Melbourne. Brisbane stands largely by itself. Another point is that the whole of the business of the State does not centre in Brisbane to the same extent as the business of New South Wales centres in Sydney. We have other ports, and the Brisbane business is purely local. I am unable to say whether business between Sydney and Brisbane is increasing, but as the result of conversations with commercial men my impression is that business between the two capitals is not of such importance as to create a big telephone traffic between the two centres.

24. To Mr. Mackay.—I have no doubt that the building of this trunk line—the expenditure involved upon it—will have some influence on the funds placed at the disposal of the Department in this State. If the Treasurer allocates a certain sum of money to the Department in this State, and a portion of it is devoted to this trunk line, it will necessarily follow that some work will have to stand down. We have been standing down, so to speak, throughout the war in regard to important trunk lines within the State. The expenditure which Queensland's proportion of this work will involve would provide for a few important intra-State trunk lines. It would be impossible for the present 400-lb. wire to Wallangarra to carry both the inter-State and the local traffic. The return I have read shows that it is already carrying a large number of conversations.

25. To Senator Newland.—It is estimated that the charges made for a conversation between Brisbane and Sydney will be 5s. 8d., and after 7 p.m., 2s. 10d. That estimate is based on the charges for the use of the trunk line between Sydney and Melbourne. In view of the higher cost of material, operating and maintenance, and having regard also to the business that may

be transacted in a three-minute conversation over the line, I do not think 7s. 6d. would be an unreasonable charge between Melbourne and Sydney. The charges for trunk line conversations between the capitals generally are too small. They have not advanced in proportion to the increase in the cost of services and operation and maintenance. The tendency, on the contrary has been to reduce charges. Maintenance charges have gone up very considerably, and there should be some improvement on the revenue side.

26. To Mr. Mathews.—It is problematical whether the line will become payable. My experience is that more business is obtained on trunk lines between correlated centres than in the case of a trunk line such as this will be, between two distinct centres.

(Taken at Brisbane.)

TUESDAY, 8th MARCH, 1921.

Present:

Senator NEWLAND, in the Chair;

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

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

27. To Senator Newland.—I do not hesitate to say that the business people of Brisbane would like very much to see a trunk line telephone established between Brisbane and Sydney. It would be a great success. Our firm alone, which, as I told you when dealing with another matter, has a gross turnover of about £245,000 a year at their Albion branches (potteries and timber mills) would undoubtedly use it regularly, and to a great extent would reduce its telegraphic messages. I do not think, however, that this trunk line telephone would interfere to any extent with the telegraphic revenue. A certain class of business can be dealt with by telephone, but cannot be carried out satisfactorily by means of telegrams and vice versa. I am sure that the proposed trunk line would be extensively used by business people, and that it would be a paying proposition.

28. To Senator Foll.—I think the commercial community of Brisbane would make full use of the trunk line. Having regard to the extent to which Sydney merchants with whom we do business use the trunk line to Melbourne, I am convinced that a trunk line between Sydney and Brisbane would also be very generally used.

Charles Taylor, M.L.A., grain and produce merchant, Roma-street, sworn and examined.

29. To Senator Newland.—It would be a very wise proceeding on the part of the Department to establish trunk line telephone communication between Brisbane and Sydney. I do not think the experience of the Department is that the telegraphic revenue has been affected to any extent by the business done on these long distance lines. I do not know how the system would operate in so far as a trunk line between Brisbane and Sydney is concerned, but there is considerable delay in securing conversation with distant centres within the State. For instance, a man who desires to get into telephonic communication with Warwick or Toowoomba has sometimes to wait for two or three hours. The problem of how best to get over the delays incidental to long-distance telephone lines is one that ought to be solved. If a man is to be called upon to wait three or four hours before he can get through to Sydney, then

he will prefer to send an urgent telegram. In cases of urgency, an urgent telegram in such circumstances would better meet his requirements. A trunk line between Brisbane and Sydney, however, would be used not only by business houses, but by quite a number of people for the purpose of conversing with friends, and in that way revenue would be secured which would not otherwise reach the Department. I believe that business people would avail themselves of the trunk line, provided that there were no serious delay in obtaining connexion. I do not think it would affect the telegraphic revenue in any shape or form. In days gone by many people declared that the railway revenue would suffer if we ran a tramway alongside a railway line, but nothing of the sort has occurred. And so with this trunk line. I believe it would be a convenience to the people of Brisbane and would prove a paying proposition.

30. To Mr. Parker Moloney.—A reply to an urgent telegram sent from Brisbane to Sydney would be received in two or three hours, particularly if it were despatched from the Central Office. If it were sent from a suburban office there would be greater delay. During the influenza epidemic I spoke from Sydney to Brisbane. The Home Secretary's Department got into communication with me; they arranged, I presume, to connect up various lines, but I do not know exactly how it was done. This took place on a Sunday afternoon, when the telephone and telegraph lines would be practically idle.

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

31. To Senator Newland.—I had intended to prepare for the information of the Committee a statement showing the revenue likely to be derived from the proposed trunk line between Brisbane and Sydney, but I read that the Deputy Postmaster-General had given evidence on that branch of the question, and felt that he could deal more authoritatively than I could with the question as to the chances of the line paying. The telegraph is the speediest means of communication with Sydney and the south that we have at present, but as a rule it is difficult to send a telegraphic message to Sydney and to receive a wire in reply the same day. Our experience is that a reply to a telegram sent from here in the morning is received too late for delivery before our offices close, and that it is included in the following morning's post. That is an out-of-date and cumbersome system in relation to a large business. Queensland stands very high among the States in respect to both its products and its industries, for we have the sugar, wool, meat, and fruit industries carried on here upon a large scale. Our relationship between Brisbane and Sydney differs from that of the other capitals in that a large number of business houses here have their headquarters in Sydney. I do not know that that relationship exists to the same extent between any other two State capitals. It is most important that these houses, doing business in a large way in this State, should be able to communicate speedily with their headquarters, and I have no hesitation in saying that the trunk line telephone will be largely used, and will prove a source of profit from the outset. The Committee is aware that a 400-lb. copper wire line has already been erected as far south as Wallangarra, and that the first section has also been erected from the Sydney end. That is a clear indication that the Federal Government intended from the outset to put us on the same footing as the more southern States. Queensland should be entitled to the same efficient means of communication that New South Wales, Victoria, and South Australia are now enjoying. It is not my desire to reflect on the way in which Queensland has been treated by the Commonwealth Government, but we have felt that, owing perhaps to the fact that we are so far removed from other centres, Queensland sometimes is left just a little in

the background. That statement applies not to the Commonwealth alone, but more particularly to shipping and other important business arrangements. We seem to have to wait until all the other States are served. In respect of such matters—apart altogether from governmental services—there is a feeling that Queensland, perhaps because of its geographical situation, is the last to be considered. We remained quiet when we knew that the erection of this trunk line was not being proceeded with because of the want of copper wire and the lack of funds, but when we learned that the duplication of the trunk line between Sydney and Melbourne was contemplated we pressed for consideration, and urged that Brisbane should certainly be linked up with Sydney by telephone without further delay. Seeing that it was actually the policy of the Government to build this line before the shortage of wire and funds occurred, we urged that this work should be carried out before the duplication of the telephone trunk line between Melbourne and Sydney. The lack of telephonic communication between Brisbane and Sydney causes greater inconvenience than the lack of a second telephone line between Sydney and Melbourne. To put it shortly, we urged that we should not be alienated in this regard from the other States, because we were so far removed from the Seat of Government. The extent to which the trunk line would interfere with the receipts of the Telegraph Department will be almost imperceptible. It may interfere with these receipts, but not to any extent, and I am satisfied that it will bring in to the Department other business which will overwhelmingly compensate for any loss of telegraphic revenue. Let us consider for a moment the family connexions in the different States. I do not hesitate to say that, quite apart from the business communications over this proposed trunk line, there will be a number of private calls after 7 p.m. A large number of our settlers go on a tour from Queensland to Sydney, where they take passages on overseas steamers, and on arrival in Sydney they want at once to get into communication with their friends here. Travellers from Brisbane will make use of this telephone line very largely. In that respect it will be used to a much greater extent than is the Melbourne to Sydney line. Above all other considerations we want to keep in the forefront the development of our business and industries. I am satisfied that the business community of Brisbane will use this trunk line very largely. Business houses have been crying out for this means of communication, and have felt the inconvenience of not having it. I should not like to pit my evidence against that given by Mr. Templeton as to the volume of business likely to be done. Mr. Templeton is a man of wide experience, and I should say that his estimate of 100 calls a day is quite within the mark. I think that at the very least that number of calls will be made. When the trunk line to Sydney is completed it will be necessary to construct a line of wire of less weight between here and Wallangarra to take the intra-State work now being carried on by means of the 400-lb. copper wire line. The fact that this lighter line is to be built is a clear indication of the anticipations of the Department as to the volume of business over the trunk line. I have come here to stress the importance of this project from a businessman's standpoint, and I am convinced, having regard to the earnestness with which business men have urged the construction of the line, that they will take the fullest advantage of it. I sincerely hope that the Committee will recommend its construction, and that it will soon be in operation.

32. *To Mr. Bamford.*—I do not suggest that Queensland has been unfairly treated in respect of postal and telegraphic services by the Federal Government. My reference was more particularly to the treatment we have received at the hands of certain steamship companies. I had in mind, for instance, the refusal to make Bris-

bane a port of call for the Vancouver line of steamers. Then, again, the Peninsular and Oriental Company and the large vessels owned by several other companies will not make this a port of call, with the result that many of our merchants have to get their goods consigned to Sydney, where they are transhipped for Brisbane. We feel that our natural position has been responsible for our having the least Commonwealth facilities. In making that statement I do not refer to postal and telegraphic services within our own State. The construction of a trunk line between Brisbane and Sydney is the only matter in respect of which we have not had extended to us by the Department the facilities enjoyed by other States.

Frederick Robert Lloyd, sworn and examined.

33. *To Senator Newland.*—I am a member of the Council of the Chamber of Commerce, and ex-president of that institution. Some of the largest businesses in Brisbane are branches of Sydney warehouses. I am manager of a branch of a large Sydney house doing business here, and as a matter of fact my own firm would avail themselves largely of the proposed trunk line. There are a number of other firms that would be delighted to have such a means of speedy communication. We rarely, if ever, send an ordinary telegram to Sydney unless at a late hour of the day, because our experience is that we cannot hope to receive a reply in time for delivery at our office the same day. We almost invariably send an urgent telegram. If this trunk line were constructed it would be just as convenient to telephone. We should be able to deal with our business quite as promptly as we could hope to do by means of urgent telegrams. Our Sydney house does business with Melbourne, and I know that our firm makes use of the line between Sydney and Melbourne to a very considerable extent. Judging by the figures which the Deputy Postmaster-General has given as to calls on other trunk lines, I think his anticipations in regard to the business on this projected line are justified. I think we should certainly have something like the number of calls estimated by him. I do not believe there would be any objection to the suggested charges. After all, firms conducting business in a large way do not consider the expenditure of a few shillings. Our firm spends hundreds of pounds on cablegrams, and promptitude is of great pecuniary importance to business people. There has been for some time a genuine demand for this convenience. We have in the Chamber a letter received from the Postmaster-General's Department some five or six years ago, in which the promise was distinctly made that as soon as the wire could be obtained the construction of this trunk line would be completed. In addition to business calls, there would be a number of private calls. There is considerable social intercourse between Sydney and Brisbane. I agree with Mr. King that the two cities are in very close relationship. Their relationship, both socially and commercially, is perhaps closer than that of any other capital cities.

PUBLIC WORKS COMMITTEE.

(Taken in Brisbane.)

THURSDAY, 10th MARCH, 1921.

Present:

Sensor NEWLAND, in the Chair;

Sensor FOLL,	Mr. Mathew.
Sensor PLAIN,	Mr. Parker Moloney.
Mr. Atkinson,	
Mr. Bamford,	

Francis William Lahey, Manufacturer, sworn and examined.

34. *To Senator Newland.*—I have asked to be allowed to give evidence before the Committee in regard to an

insulator which I have patented throughout the Commonwealth and the United States of America. The Committee is probably aware that a telephone or telegraph wire is tied to the ordinary insulator now in use by copper wire. Fourteen turns are made on each side, and this requires the use of a yard of copper wire. My patent insulator does away with the use of any copper wire for that purpose, and reduces also the cost of labour. The line wire is stretched in the ordinary way, and is then placed in the slot of the patent insulator. By turning the insulator on the pivot of the cross-bar half way round we get a complete lock without any tying. Should the telephone wire break between the poles it may run out in the case of one insulator only; the others will grip. We go further and guarantee to place my insulator in position, and to lock it, from the ground. That is done by means of a patent lock, which we include with the insulator. Should there be other wires below the point at which we are putting up a new wire it is impossible to get the necessary pull to take a quarter turn. This, however, is overcome by the patent lock. If there are no wires in the way, we can lock it with the one action: We have a clip which holds the insulator, and by means of which we can raise the insulator from the ground and drop it over the pin. I have submitted my patent to the postal authorities in Melbourne, and they are taken with the idea, but we have experienced great difficulty in connection with the manufacture of the insulator in the Commonwealth. So far as we have gone, the authorities in the United States of America are willing to take it up. Local manufacturers, however, have not got into the way of manufacturing this lock system on an insulator. The ears and lugs would not break in even a violent storm. To test this we have fastened one of our insulators to a peg on a stand, attached a wire to it, have fastened the other end of the wire to a winch, and when we have put a strain on the wire by means of the winch the wire ultimately has broken but the porcelain insulator has remained good. The sample I produce is made of Queensland porcelain.

35. *To Mr. Mackay.*—From what I can gather, the cost of my insulator, if manufactured in America, will be only fractionally greater than the cost of those now being used by the Department.

36. *To Senator Newland.*—I have not shown my patent to the Brisbane postal officials. I am fairly confident that it cannot be manufactured here. This sample was made by hand, and was glazed and baked at a local pottery. The fact that the wire in being attached to my insulator has to be twisted slightly involves no damage to the wire at all, nor would the pressure involved in screwing the wire into the insulator have any effect on the current. The strain so exerted is not so great as to affect the wire. I have had no experience in fixing telephone wires, but one of my colleagues has. From a scientific point of view, I do not know whether the pressure exerted on the wire in connection with our locking system would affect the efficiency of a line. Engineers who are familiar with such work seem to regard my patent as an excellent one. I am not too strongly impressed with the porcelain of which my sample is made, and am inclined to wait until I can have some insulators manufactured in America before submitting them to a proper test here.

37. *To Mr. Bamford.*—The locking system would not be affected by any fault in the porcelain itself.

38. *To Mr. Mathew.*—It would not be possible for the insulator to unlock in a storm. There is a recess in the insulator to receive the wire, and the weight of the wire would keep it in position. It requires a fair degree of pressure to bring the wire out of the recess. The greater the strain the greater is the tendency to pull the wire into the recess. My application for a patent in the United States of America was not opposed.

39. *To Mr. Mackay.*—The wooden peg is fastened in the insulator before we put it in position. There is no

danger of the insulator turning back on the peg, because we have a right and a left hand turn. The turn of the wire is against the turn of the peg. I cannot give the local authorities a demonstration, because I have not yet been able to obtain the porcelain I want. Our Brisbane porcelain is not good enough for the purpose. I am not ready at present to manufacture insulators on a commercial basis. Our idea is to sell our patent rights, and my desire in coming before the Committee was to show that the proposed satisfactory method would be economical to use our insulators on the proposed trunk line, as well as generally. I am a native of this country, but people with an inventive turn of mind receive no encouragement here. From what I can gather, had I gone direct to the United States of America I could have taken out my patent there for £5, whereas it cost me £38 to do so because I had already taken out patent rights for the Commonwealth. In the United States of America I would have received assistance, not necessarily from the Government, but from private enterprises, as soon as I had secured my patent. A poor man who has a satisfactory patent should be given a chance, but one is not given a chance in Australia. I realize that my patent rights would be worth more with a satisfactory test, but in order to give a satisfactory test I need money. I have endeavoured in Brisbane to secure financial assistance and have some prospect of success.

40. *To Mr. Atkinson.*—The chief advantages of my insulator are that it saves labour and reduces cost inasmuch as it renders unnecessary the yard of copper wire now used to tie a wire to an insulator. The key system also does away with the necessity of climbing the poles in order to put the insulator in position. I am satisfied that my process of locking would not interfere with the current, but I have had no sufficient test.

41. *To Mr. Mathew.*—I submitted my patent to the Melbourne Porcelain Company, and was told that they could not manufacture these insulators.

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

42. *To Senator Newland.*—The proposal to erect a trunk-line telephone between Brisbane and Sydney was taken in hand by this office while I was on leave, and it furnished to the Central Office information as to the probable cost. The Brisbane-Wallangarra portion of the trunk line was built in 1916 of 400-lb. copper wire, and, pending the completion of the Sydney-Wallangarra portion of the trunk line, it is being used for local purpose. The total length of the circuit will be 657 miles, of which the Queensland portion will be 165 miles. That is somewhat different from the information submitted in Sydney, where it was thought that the line would go via Toowoomba, whereas it is to go through Spicer's Gap, which is a more direct route. We told the Central Office that the 400-lb. line (No. 408-9) between Brisbane and Wallangarra was carrying an overload of traffic from the wayside stations, and that to enable its release for Inter-State business it was proposed to erect circuits of lighter gauge wire to carry the local traffic. This will simply be so to speak, a matter of patching up circuits. In addition to the 400-lb. copper wire line erected as part of the trunk line between Brisbane and Wallangarra, there is in use, between Brisbane and Warwick, a 200-lb. H.D.C. circuit (Nos. 202-3), and this also is carrying a heavy overload of traffic. On the sections Warwick to Wallangarra there is a 200-lb. H.D.C. circuit (Nos. 370-1), between Warwick and Stanthorpe, and a 300-lb. H.D.C. circuit with telegraph superimposed between Stanthorpe and Wallangarra (Nos. 11-11A). Between Warwick and Stanthorpe there is also a Callio telephone circuit, or, in other words, a telegraph circuit with a telephone circuit superimposed, on Nos. 11 and 11A, which are of 400-lb. wire on this section. Both circuits between Warwick and

Stanthorpe are carrying traffic overloads. To afford relief for local business and to leave the existing circuit 408-9 free for Inter-State business it is proposed to provide another 200-lbs. copper physical circuit between Brisbane and Warwick, utilizing (a) between Brisbane and Kalbar Nos. 215 and 216 (200-lbs. copper), already erected for the Brisbane-Kalbar-Bonah trunk; (b) between Maryvale and Warwick Nos. 362-3 (200-lbs. copper), already erected for the Maryvale trunk; and (c) between Maryvale and Kalbar erect two 300-lbs. H D C wires. This arrangement, together with the existing 200-lbs. physical circuit Brisbane-Warwick Nos. 202-3) will provide two 200-lbs. copper physical circuits, and over these it is proposed to superimpose a phantom circuit. This will provide between Brisbane and Warwick three direct trunk circuits. A phantom circuit is a third circuit derived from two physical circuits. This system at the present time is being superseded by a more modern one. Between Warwick and Wallangarra two 100-lbs. copper wires will be erected to afford relief to local traffic. The section between Stanthorpe and Cotton Vale is already completed in connection with the provision of telephone connection to the soldiers' settlements at Amiens and Pozieres. To replace the 200-lbs. copper wires which will be taken between Brisbane and Kalbar it is the intention to erect between Ipswich and Kalbar two 100-lbs. copper wires, and between Maryvale and Warwick two 100-lbs. copper wires. As these two lines are only of short distances, 100-lbs. copper is electrically efficient for the service. Between Brisbane and Ipswich a further circuit will be provided by a phantom over the existing physical lines. The estimated cost for carrying out the work to be done between Brisbane and Wallangarra is £13,275, as follows:—

Material—Copper wire and associated copper material ..	£2,457	
Crossarms ..	50	
Insulators ..	288	
Splindles ..	468	
Miscellaneous items ..	987	
Labour—Permanent ..	765	£4,250
Temporary ..	4,140	
Allowances—Camping ..		890
Sundry Charges—Freight and cartage ..	200	
Forage, shoeing, &c. ..	300	
Incidental expenditure ..	505	
		1,005
Administration charges ..		2,225
		£13,275

In the above calculation the price of copper has been taken at £154 per ton, the approximate present date price (9th March, 1921). The existing trunks between Ipswich and Warwick and between Warwick and Wallangarra are affected by wheatstone induction, there being on the same poles between Ipswich and Warwick two automatic telegraph circuits, and between Warwick and Wallangarra three automatic telegraph circuits. Whilst this inductive disturbance has not materially impaired the efficiency of the 400-lbs. circuits as now used for local business, the effect of the induction would be to very materially decrease the transmission value of the circuit when used for Inter-State business between Brisbane and Sydney. In order to eliminate this induction it is therefore necessary to rearrange the wire on the poles separating the telegraph and telephones and providing a greater separation between the telegraph arm which will be carrying the

wheatstone circuits and the arm carrying the trunk lines. The estimate submitted provides for this work. When the 400-lbs. copper circuit is made available for through Inter-State business, similar arrangements to those at present existing on the Sydney-Melbourne line for the superimposition of telegraph business can be arranged, and two Canadian duplex circuits can be provided over the two legs of the trunk. This will also have the effect of relieving the congestion on existing telegraph circuits between Brisbane and Wallangarra. Another circuit is now reported to be necessary between Warwick and Wallangarra, and will be provided over one of the telephone lines between those towns. It is difficult to estimate the traffic that will be carried over the trunk line, and the only data available are those relating to the Sydney-Melbourne trunk line and a comparison between the telegraph business between Brisbane and Sydney and Sydney and Melbourne. The average daily telegraph business between Sydney and Melbourne is reported to be 1,538, and between Sydney and Brisbane 1,013. In other words, the ratio of Sydney-Melbourne to Sydney-Brisbane is as three to two. The total traffic on the Sydney-Melbourne trunk line is reported to be 160 calls daily, and, assuming that the telephone business Brisbane-Sydney will bear the same ratio to the Sydney-Melbourne telephone traffic as it does between the telegraph business, the calls daily would be estimated at 100. This is slightly less than the traffic on Melbourne-Adelaide telephone line, which is reported to be 120 calls daily. It is not likely that a load of 100 calls daily will be reached at once, and it is estimated that when the line is opened the load will be forty calls daily, increasing as the facility becomes better known. On the Sydney-Melbourne line approximately 38 per cent. of the calls are made after 7 p.m., when half rates apply; and, assuming similar conditions will exist on the Sydney-Brisbane line, there would be twenty-five full rate calls and fifteen half-rate calls daily. The revenue would, therefore, be £9 4s. 2d. daily, or £3,361 per annum. Assuming that the revenue to be credited to the Queensland portion of the line would be in the same proportion as the mileage of line in Queensland to the total length of line, this would be 165-667 of £3,361, or £481 per annum. It is estimated that the revenue would increase by one-third in the second year, making the total revenue £2,481 and the Queensland proportion £1,126. The actual cost for erecting the two 400-lbs. copper wires (Nos. 408-9) between Brisbane and Wallangarra was £9,766, and the annual charges against the line are as follows:—

Interest, 5 per cent. per annum ..	£488 12 0
Sinking fund ..	48 0 0
Maintenance 335 miles of wire at £1.202 ..	426 0 0
per annum (actual cost) ..	58 0 0
Operating costs per annum ..	58 0 0
Total ..	£1,020 12 0

It is proposed to erect a 200-lbs. copper wire line for some part of the way between Brisbane and Wallangarra and other portions will be served by 100-lbs. copper wire lines. We will make a series of transpositions which will free our 400-lbs. copper wire line for trunk line purposes. Any person desiring to speak from stations beyond or adjacent to Brisbane will be switched through to Brisbane if he desires to talk to Sydney. Persons at Wallangarra will be able to speak through to Sydney on other circuits. They may not necessarily have to speak first of all to Brisbane, they may get switched through an existing Sydney circuit as at present. The trunk line is intended solely for the use of people desiring to speak from Brisbane or Sydney. It will not provide any additional convenience for intermediate stations. It may be quite possible to connect waveguide stations with the trunk line, but it would be a big job to do so. With every station that was connected there

would be a considerable reduction in the transmission efficiency of the line. No object would be served in connecting intermediate stations if there were sufficient business between Brisbane and Sydney to keep the trunk line busy.

43. To Senator Foll.—Toowoomba and Ipswich will have no trouble in speaking to Sydney through Brisbane. Calls from those towns will be dealt with in their order. And so with Warwick. Warwick, however, would have facilities for getting through on the 300-lbs. copper line which now exists on the New South Wales side. This trunk line is a public necessity, as it is just as necessary as are the trunk lines between Sydney and Melbourne and Melbourne and Adelaide. I firmly believe that within twelve months it will become profitable and fully loaded. It will create business such as would not be done over the ordinary telegraph lines. It will interfere to a slight extent with our telegraph revenue at the outset, but will rapidly develop a business of its own. I am of opinion that by the time that wireless telephony develops sufficiently to make it a commercial proposition as between Brisbane and Sydney, the business on this trunk line will have grown to such an extent that the added facilities provided by wireless will not interfere with the usefulness of the trunk line. Some time will elapse before the full development of wireless telephony. I have here one of the latest authorities on the subject—a book, entitled *Radio Telegraphy*, written by Mr. A. N. Goldsmith, Director of the Radio Telegraphic and Telephonic Laboratory, and Professor at the College of the City of New York. In this book, which has only reached us within the last three or four months, the author publishes a graph dealing with radio versus wire telephony, and in referring to it he writes:—

It is very difficult, if not impossible, to institute a fair comparison between these fields—radio versus wire telephony—at the present time. Radio telephony is so far from having reached an advanced stage of development, and is so seriously threatened on the research side, by Government control and naval or postal administration, that our conclusions are little better than guesses. However, certain broad considerations are fairly obvious and probable.

In Fig. 1, he gives curves showing the distance of transmission in one direction and the cost per message in the other. It shows that until the line reaches a distance of 1,500 miles it is more profitable to conduct your service by wire instead of by radio. The writer goes on to state that:—

For short distances there seems to be no question as to the superiority of wire telephony. The difficulty of preventing interference between a multiplicity of radio stations, the first cost of even a low power radiophone station, the first cost of the transmitting and receiving antennae and ground, and the occasional skilled attendance required (at least by present-day radiophones) render the idea of replacing the complex network of a city's wire telephone system by radiophones highly improbable.

According to this authority it would seem that short-distance wireless telephony, because of considerations as to cost of plant and skilled attendance, is less practicable than long-distance wireless telephony. What we really have to look for and expect is a development along the lines of what is called wave-carrier multiplex wire telephony. During the war period there was developed by the Americans an invention which is being vigorously pursued at the present time by the Germans, who are very short of raw material, to utilize one pair of wires for a number of simultaneous conversations by means of high frequency currents having different wave lengths. Telephonic speech is superimposed upon each

of these wave lengths. The whole matter is well described in an article published in the *Telephone Engineer* of 20th September last. The same subject is also dealt with in an issue of the *Western Electric News* of 11th December, 1918. Under such a system it is possible to send telegrams and telephone messages simultaneously on the same line, so that with such a system in operation we shall be able to extend our present facilities without greatly adding to our costs. It would be a pity to go to the expense of erecting more than one trunk line, but we must have at least one such channel of communication, so that no mistake will be made in proceeding at once with this proposition. The system discussed in the article to which I have just referred is really on the same principle as wireless telegraphy, except that instead of sending messages on waves by wireless we would send them along a metallic path. If that system were perfect this trunk line could be used both for telegraphic and telephonic purposes. Once this wire is erected we shall be able to give further facilities than would be available at the outset. I have nothing to do with the purchase of copper wire. Purchases are made from the Port Kembla Company. When tenders are accepted the price is fixed on the price of copper on the day the order is received.

44. To Senator Newland.—I believe there is in the Department some correspondence with Mr. Lahay in regard to the patent insulator that he has described to the Committee to-day. We are waiting for him to supply us with some of his insulators in order that we may make a test. The insulator as produced by Mr. Lahay to-day is not suitable for the purposes of our Department. It could not be used under any circumstances for copper wire lines. Hard-drawn copper wire relies for the whole of its strength on its hard-drawn outer skin, which is about one-thousandth of an inch in thickness. One has only to "nick" or break that skin by giving it the slightest tap and the wire will break off at the point so injured. With the outer skin uninjured the wire may be bent with the most perfect freedom. This fact was so well known to us that we designed a special tie to prevent the chafing of the wire against the insulator. We wrap a band round the wire so that the wire itself does not actually touch the insulator. The fastener that Mr. Lahay showed the Committee this morning is used only for iron wire. If we were to kink wire as he did this morning its tensile strength would be very materially reduced. We therefore unwind it from covered drums, and we wrap the frame or arm with cloth to keep the wire as straight as possible. The Committee will thus see that Mr. Lahay's patent insulator would be quite impracticable for use in connection with copper wire lines. Twenty-five years ago we used to bind our iron wire lines to the insulators by means of a short piece of iron wire of the same gauge as the line wire. We discovered, however, that owing to the vibration caused by the wind the wire cut through at a certain point. Furthermore, the wire cut into the insulator, and as insulators depend for their insulating quality upon their glaze it was found that as the result of the wire cutting into them they became worthless in a very few years. We therefore abandoned the clip, and adopted the tie shown in the picture which I now put before you. If Mr. Lahay's insulator were used with iron wire the weight of each span would hang on the corner of the insulator, and would so chafe it that it would quickly lose its insulating qualities. A mere chip from an insulator renders it useless. We can regulate a mile of wire at a time under our present system, but that would not be possible if Mr. Lahay's insulators were adopted. His scheme would be costly, unsuitable, and impracticable. If we think a patent is

foredoomed to failure we consider it only fair to recommend that a trial of it should be given at the expense of the inventor. It will be for the Department to say whether this patent should have a trial.

45. *To Mr. Mackay.*—If the erection of this trunk line is authorized the principal expenditure will be in New South Wales. There will be no shortage of skilled labour on this side of the border, and its erection would not delay the construction of lines in Queensland.

46. *To Senator Foll.*—At present we have not the necessary material on hand. If the project be approved we shall be able to make the Brisbane to Wallangarra portion of the line available within three months of the date on which we obtained supplies of wire. So far as the north coast is concerned, I think we would be able to let Rockhampton, Maryborough, and Gympie come into this service. We have not the apparatus available at the present time to enable those towns to come in, but it could be arranged. We have been developing the repeater. The thermionic valve provides a very efficient telephonic repeater, which has made speech quite practicable on the Brisbane to Rockhampton line. We have installed repeaters at Muttahburra, and they have made it possible to speak over very undifferent lines to Winton, via Barcaldine, Aramac and Muttahburra from Longreach. The engineering heads of the Central Office have decided that we should not move quite so fast with regard to these repeating processes as they desire to standardize them. I understand that they are importing sets of repeaters with a view to carrying out their standardization. Until we have further advice from them I cannot say what we shall do with regard to the use of repeaters, but I know that the cost of putting them in is a negligible item. We can make up repeaters here for less than the price at which we can import them, and are finding them highly satisfactory. They have opened up unheard of avenues of development. People will be able before long not merely to speak between Brisbane and Townsville, but to sit in their offices in Melbourne or Sydney and address audiences in any town in the Commonwealth. The thermionic valve gives not only a telephone repeater, but also a loud-speaking telephone, through which an orator could address an audience in the most remote towns in the Commonwealth. The voice can be magnified in this way a million times. According to a recent article, some of the Western Electric officials were able by this means to say "good-bye" to one of their co-workers as he was leaving New York for Great Britain, their voices being clearly heard above the noise and din along the water-front as the steamer went down the river. The Deputy State Engineer of the Department in this State visited America immediately after the war, and brought out very valuable information in regard to this war-time invention and with his assistance I have followed up the matter since his return. A portion of his time has been devoted to experiments, and we have developed a repeater, and are talking through repeaters in this State.

47. *To Mr. Hanford.*—We have not introduced the loud-speaking telephone here, but it has been developed in the United States of America.

48. *To Senator Foll.*—We have no research branch in the Postmaster-General's Department. There should be such a branch not only in the Central Office but in each of the States. Officers should also be sent abroad periodically to gain experience.

49. *To Senator Newland.*—Returning to the question of insulators, I produce samples showing the methods adopted by us to protect the wire. I also produce a sample of the standard copper tape binder and of the old clip which we have abandoned. The physical properties of the skin of the copper wire must be protected.

(Taken at Sydney.)

MONDAY, 21st MARCH, 1921.

Present:

Mr. GREGORY, Chairman;
Senator Foll, Mr. Hanford,
Senator Newland, Mr. Mathews,
Mr. Atkinson, Mr. Parker Moloney.
John Maitland Paxton, shipping agent, sworn and examined.

50. *To Senator Newland.*—I desire to represent the views of the Sydney Chamber of Commerce, of which I am President, with regard to the construction of a telephone trunk line between Sydney and Brisbane. The matter is one which the commercial community have been agitating upon for years past, and we are anxious that the work should be carried out. I am confident that it would be extensively used at this end, and I understand the same would apply to the business community in Brisbane. The trunk line might not pay for the first year or two, but it would inevitably pay before long, and the connexion will prove a distinct commercial gain to both cities. Very extensive business is done over the trunk line between Sydney and Melbourne, and I am confident of the usefulness of the connexion when Brisbane has been linked up.

The witness withdrew.

(Taken at Melbourne.)

TUESDAY, 3rd MAY, 1921.

Present:

Mr. GREGORY, Chairman;
Senator Foll, Mr. Mackay,
Senator Newland, Mr. Mathews,
Senator Plavin, Mr. Parker Moloney.
Mr. Atkinson,
Edgar Becher, Supervising Engineer, Chief Electrical Engineering Staff, Central Office, Postmaster-General's Department, sworn and examined.

51. *To the Chairman.*—It is proposed to construct a trunk line telephone between Brisbane and Sydney of 200-lbs. copper wire, with telephone repeaters. As to the evidence given before you in Sydney, that the estimated cost was based upon copper wire costing £168 per ton, I am afraid that I cannot give you details in regard to external construction. I deal with telephone exchange equipment within the buildings themselves, and although I have general information concerning external construction costs, I have not the exact details. In the *Commonwealth Gazette* of 28th ultimo, which you put before me, there appears a list of new tenders for copper wire in which the prices quoted for Queensland are—For 400-lbs. copper wire £117 per ton, 300-lbs. copper wire £117 per ton, 200-lbs. copper wire £117 10s. per ton. Under the conditions £1 has to be added to or subtracted from the tender price for each variation of £1 in the price of copper based at £60 per ton. The present market price of electrolytic copper is, you say, £74 per ton, so that to the quotation of £117 10s. per ton for copper wire £14 would have to be added, bringing the cost to-day to £131 10s. per ton as against our estimate of £168 per ton. You desire to know whether the Committee may assume that the wire could be obtained for this line at £131 per ton. I cannot say without making inquiries in the Department. I did not prepare the estimate. It was drawn up about three months ago, but I recognise that the Department would not buy at the top of the market. If the wire were obtainable at £131 10s. per ton when we were about to erect the line we would certainly get it at that rate. I see that the

Deputy Postmaster-General, Brisbane, gave evidence that on 17th March last he had received information that copper wire could then be obtained at £154 per ton. The Department would certainly buy in the cheapest market. I am not conversant with this phase of the matter, but will make inquiries and advise the Committee as to what these new tenders exactly mean, so that you may know what price will be paid for the wire.

52. *The Chairman.*—In the annual report of the directors of the American Telephone and Telegraph Company for the year ending 31st December, 1919, the following statement appears with regard to telephone lines:—

Cables in long-distance lines have always greatly limited the distance through which speech may be transmitted, but as the increase in the number of long-distance wires has made necessary the employment of increased lengths of long-distance cable, the technical difficulties presented in the transmission of speech through such circuits has seemed at times to be almost insurmountable.

Intensive development work has been applied, particularly during the last five years, to this cable problem. Each new long-distance cable that is constructed represents important improvements over what has gone before. Cables placed as late as 1916 contain circuits for long distance transmission, having 320 lbs. of copper per mile of circuit. By means of cables which we have now developed it is possible to give even better transmission over circuits having only 80 lbs. of copper per mile of circuit.

This type of cable is now available for distances as great as 1,000 miles. In cities it is placed in ducts under ground, and in the country districts it is, in general, run on poles overhead.

Speech can be transmitted through 2,000 miles of this new type of cable, with its circuits weighing only 80 lbs. a mile, as distinctly and as loudly as it is now transmitted through the heaviest-gauge open wire strung on poles, which weigh 875 lbs. to a mile of circuit. This type of cable, like all other types of long-distance cable, is applicable only where a large number of wires are required along heavy trunk line routes. In such situations, in due course, the new growth will be provided for in these cables, thus utilizing at greatly reduced cost a form of construction which practically guarantees continuity of service and high grade transmission, regardless of weather conditions.

As time goes on, the savings which will result from the use of these cables will be enormous, amounting ten years hence, according to a very conservative estimate, to as much as 5,000,000 dollars, not making any allowance for improvement of service or lost business due to interruption.

I recognise that it would not do to put in such cables where you have but a comparatively small number of calls, as between Sydney and Melbourne; but I want to know whether the Department has given consideration to their use in Australia, and whether they would

ultimately effect a saving!—The Chief Electrical Engineer intends to inquire into that matter while he is abroad. It is quite a new development, and has been made possible only by the use of telephone repeaters. It would only pay to lay such cables between big centres when you had a heavy volume of traffic. Between New York and Chicago a distance of, roughly speaking, over 1,000 miles they are running, or have run, a 300 pair light gauge cable. They are also running the same size cable between New York and Philadelphia—a distance of 90 miles. The volume of traffic between New York and Philadelphia, and also between New York and Chicago, is, however, tremendous; we have nothing like it in Australia. I think we have estimated that between Melbourne and Sydney, during the next five years, we shall probably have at the most five simultaneous connexions, or, in other words, that there will be at the most five members of the public speaking between Melbourne and Sydney at the one time. It would not pay us to lay down a cable for such a relatively small volume of traffic. Another consideration is that the American trunk line telephone services are run on practically a no-delay service, whereas here on our trunk telephone lines every person desiring to make a call has to wait his turn.

53. *To Senator Foll.*—In the United States of America they make a feature of rendering services with as little delay as possible. In the case of the service between New York and Philadelphia the arrangements are such that the maximum delay is only twenty minutes. No matter at what hour a person makes a call, he has not to wait for more than twenty minutes.

54. *To the Chairman.*—The serious complaints of which you heard in Sydney in regard to delays on the trunk line between that city and Melbourne are, speaking frankly, due to the fact that we have not enough lines between the two cities. Even by means of the new line we propose to erect we shall not obviate all delays; we shall require five lines to do that. As to the number of wires in one of these cables, we can get a cable containing from two pairs up to 800 pairs—everything depends upon the service for which the cable is required. If we were to erect a cable with only a small number of pairs and the gauge of the conductors in that cable was very light, it would be necessary to pay great attention to the constructional details of the cable. Such a cable between here and Sydney, or Sydney and Brisbane, would be erected aerially, and would have to be designed to resist the maximum wind pressure and other forces. These conditions are a very important consideration in the design of light-gauge conductor cables. It is one of the points into which the Chief Electrical Engineer will inquire while abroad. We have, as you say, a telephone line running from Sydney to Armidale, and another from Brisbane to Wallangarra, but it would not be sufficient merely to bridge the intervening space. The volume of traffic expected on the trunk line is too great to allow of that being done. It would lead to the overloading of the local lines.

The Committee adjourned.