"The Palace of Winged Words"

THE DEVELOPMENT OF TELEPHONE EXCHANGES IN AUSTRALIA

THE WONDERFUL MECHANISM AT WORK.

Arrangements for the transfer of the Geelong telephone exchange to the automatic system were altered slightly yesterday. It will take place to-night as announced, but at 11 p.m., instead of midnight. As a matter of fact leads from the old switchboard to the new have been in for some time, but fibre discs have broken the circuit to the automatic switchboards and the removal of these to-night will bring the new system into operation. Mr. Green the head electrician, and his staff of inter-State assistants hope to carry out the change over in from 20 minutes to half an hour.

The new service is known as the Strowger system which has only lately been installed at Epsom ... the first place in the B... have the automatic excl... long will be first south of ... patent is in the hands ... Telephones, Limited, Chi... bring it to its present st... human ingenuity and I ... years of study and expe... been needed. Nothing co... human; to see it work an... it does makes it look sup... is so ingenious as to al... complete description. In ... phone room at the Geelon... are a series of iron and gl... filled with neat devices won... licate of construction but ... accurate. These are lin'... a maze of wires, charge... generated by a 10 h... feeds a series of ste... force of this curre... powerful system ... What happens w... is not easy to de... cate and astoundi... ... imagine hu...

... tal posts and complicated ... branch offices have been suc... ercial men, but private ci... ich the extension of the ide...

..., as a matter of course, there ... invention the utility of whic... In New York the list of firms who employ ... mbers over 2,000, and according to the latest returns ... ncreasing, while in Denver, a comparatively small ... rado, verbal communications are exchanged by 300 ... establishments of every description, distance being ... stacle whatever to this flying conveyance of con... n fact, the whole method of working the machines ... imple, when once explained, as to out-Columbusise ... l egg and render the observer simply puzzled as to ... it was never thought of before. Of its utility there ... opinions. An invention which will enable a man ... own office to ask his banker for an overdraft, order ... is tailor, ... an opinion from his lawyer, state ... s doctor ... reasonable excuse ...

YESTERDAY afternoon a number of leading citizens met at the offices of Quinlan, Gray, and Co. to test the telephonic line of communication put up between that establishment and their Castlemaine Brewery at Milton, some two miles distant. The experiment was very successful, persons speaking at one end of the line being as distinctly heard at the other as if speaker and listener were in the same apartment, thus proving the connection perfect in all respects. The gentlemen present—amongst whom was the Postmaster-General—expressed complete satisfaction with the tests made. Now that Quinlan, Gray, and Co. have inaugurated the new system of interchange of speech, we expect th... many imitators amongs...

... vords fly," with the additional advantage of not ... ch risk of losing one's temper as if the "other ... ually in the same room. It would, in fact, be diffi ... many rows, domestic and others, might have bee ... earlier use of the telephone, especially as, in th... n Scudder, "the apparatus can't lie." The perso... nay exercise their discretion in that direction, b... r of their being misrepresented. Your do... black draught instead of a Gregory's pow... r own fault for not telling him your sym... rate, one or two doctors have already I ... e telephone, and are kept "switched" on... spectively employ all night. In more th... n found of considerable benefit, and mu... nience have been avoided... atters of police and ... to see ho...

THE experiments with the telephone which en... Mr. Severn is conducting are, considering that ... el... he has not seen the instrument and to a great i... extent is working in the dark, very successful... and quite so as far as demonstrating the theory of ... conveying sound by the electric wire. Yester-... day an experiment was made via Ipswich, and ... succeeded—the length of the circuit being nearly ... fifty miles. Mr. Severn is, however, still unsa... tisfied, and, wishing to operate on a still greate... length of line, purposes, we believe, to have a t... ...th Rockhampton.

... postponed; but whether sufficient commo... ... ss among our various rulers to allow of its adoption rema... oubtful. That it is necessary, a visit to any one of the Goveri ment offices will show at once.

In conclusion, we can only say that any persons who may have any doubts as to the facility and speed with which telephonic communication is carried out, need only pay a visit to the "Palace of Winged Words," and Mr. Byron Moore will speedily dispel them.

THE INTERCOLONIAL YACHT REGATTA, HOBSON'S BAY.

THE yacht regatta which was held in Hobson's Bay on Saturda ... ary 15, under the management of the Victoria Yacht Cl ... ... mbered by the lovers of yachti...

... he required to place any two stations in ... munication is wonderfully brief. The office ... e kept open for the present from 9 in the ... ing till 5 in the afternoon, except on Satur... when the hours will be from 9 till 1; but ... ld any two stations require to communicat... hours a message to the central office ... e the connection to be left on all night... ing from the exchange room is accomplis... alvanic currents, which are transmitted al... line by an instrument called a "pole change... ch automatically sends reverse curren... s a beautiful little piece of mechanism, wh... omplishes its work to perfection without a ... ntion from the clerk in charge. We m... mention the combined receiver and tra... ter supplied for the use of the operator. ... inary telephones the transmitter is fixed ... so that one must always stand in tl... t whilst talking, but to enable the cle... whilst attending to the switch, tl... r and transmitter are connected by ... curved bar in such a manner that whe... ormer is placed to the ear the latt... s just opposite the mouth... e important uses to which business ne... apply this system of telephone exchang... readily suggest themselves to those int... ted, and as the value of this mode of com... munication becomes better known, there is n... oubt that additions will have to be made t... he accommodation of the switch-board at the ... entral office, which at present is equal t... receiving fifty wires from as many different ... points, and will allow of conversation being ...

The Telephone Exchange.

WE have on previous occasions referred to the undertaking of the Government to establish in this city a telephone exchange similar to those which have proved so successful in the principal cities of Great Britain and America, and now that the system is to some extent in working order here, we propose to give a short account of the method pursued. The rapid increase in the number of telegraph wires in the streets near the Electric Telegraph Office must have been noticed by all who have business in that direction, whilst the unusually large posts upon which the wires have latterly been hung, some of them not less than 30ft. in height, must have been with many persons a subject of curious speculation. These posts are necessary in order to carry the telephone wires across the streets at a sufficient height above the ordinary telegraph lines, whilst the nume-... ... es are necessitated by the fact ... ...ired for every instance in ... ...cation is to be esta-... ...d with the Minis-... ...ssembly, as well as ... ...2d besides these ... ...onnecting private ... ... As yet there are ... ... the Queensland ... ...sidence connected ... ...delay has arisen ... ...t suitable poles for ...

...ccasion, the design ... ...e subscribers shall ... ...ffice in such a way ... ...ny one of them can ... ...munication with any ... ...e an office in the Electric ... ...ng has been set apart as an ex-... nto this room all the telephone ... west, north, and south are con-... d in connection with a beauti-... pparatus technically known ... ... This...

THE very substantial posts to be seen for th... past few days in front of Messrs. Quinlan, Gray ... and Co.'s warehouse, and the erection of whic... without permission has aroused the ire of son... of the City Fathers, are, we understand, to ser... as supports to a telephone wire connecting t... warehouse of Messrs. Quinlan, Gray, and C... with the Castlemaine Brewery. It is to ... regretted that Quinlan, Gray, and Co. ... far forgot the obviously proper mode ... procedure preliminary to such work, as no... have sought the permission of the Corporati... but we think the firm is to be congratulated ... being the first in this colony enterprising eno... to inaugurate telephonic communication. ... notice served on Quinlan, Gray, and Co. ... direction of the Mayor, will no doubt pr... their giving any further cause of complaint ... we trust that when the requisite permiss... asked for the request will be met in a ... spirit, and not in the absurd temper of ... who suggested that the posts should be fo... ... direction of the Cit...

change room. Into this room all the telephone wires from east, west, north, and south are conducted and placed in connection with a beautifully ingenious apparatus technically known as a "switch board." This occupies a small screen in one corner of the room, and is under the constant care of a clerk told off for the purpose. Premising that each of the subscribers to the exchange is designated by a number, we may best explain the system by giving a suppositional case. Let u...

...shut ... ...ber ... ...take ... ...key ... ...with ... ...in te ... ...rings ... ...corne ... ...anoth ... ...the c ... ...tion ... ...be re ... ...have I ... ...that w ... ...No. 8 ... ...second ... ...intima ... ...operat ... ...scribe ... ...of tin ... ...comm ... ...will be ... ...morning ... ...days, w ... ...should ... ...after ho ... ...cause th ... ...ringing ... ...by galva ... ...the line ... ...which ... ...It is a b ... ...accompli ... ...attention ... ...also men ... ...mitter su ... ...ordinary ... ...the wall, ...same spot ... ...to talk ... ...receiver ... ...short cur ... ...the form ... ...comes jus ...

The in... ...may appl ... ...will readi ... ...rested, and ...

"The Palace of Winged Words"

THE DEVELOPMENT OF TELEPHONE EXCHANGES IN AUSTRALIA

"This is a great day with me and I feel I have at last struck the solution of a great problem — and the day is coming when telephone wires will be laid in to houses just like water or gas, and friends converse with each other without leaving home".

Alexander Graham Bell
10 March 1876

Introduction

In 1880, the first telephone exchanges opened in Australia.

It's hard for us today, a century later, to appreciate the impact that the new invention of the telephone had on our young country. Today, we tend to take the telephone for granted. But once Alexander Graham Bell had demonstrated a practical telephone, in 1876, the impact on society was swift and enormous.

The fact that it was only four years from the initial invention to the establishment of commercial exchanges in a country so far from the rest of civilisation as Australia speaks for itself. The new "scientific wonder" was greeted with a great deal of eagerness in Australia by both the business community and the general public.

Part of the reason for that eagerness might have been the fact that for so long the colonies had been isolated from Europe and America. This isolation — "the tyranny of distance" — had only recently been broken, in 1872, by the construction of the Overland Telegraph Line, linking Australian cities with a submarine cable to Java and from there through to London and Europe. For the first time, telegraphs could pass in a matter of minutes between England and her antipodean colonies.

Then came the telephone, promising swift communication by speech over long distances. Moreover, such communication could be carried out by anyone with an instrument — the messages did not have to pass through an operator trained in Morse code, but were as easy and simple as normal conversation. Small wonder that the idea caught on so rapidly!

An early Bell telephone in use.
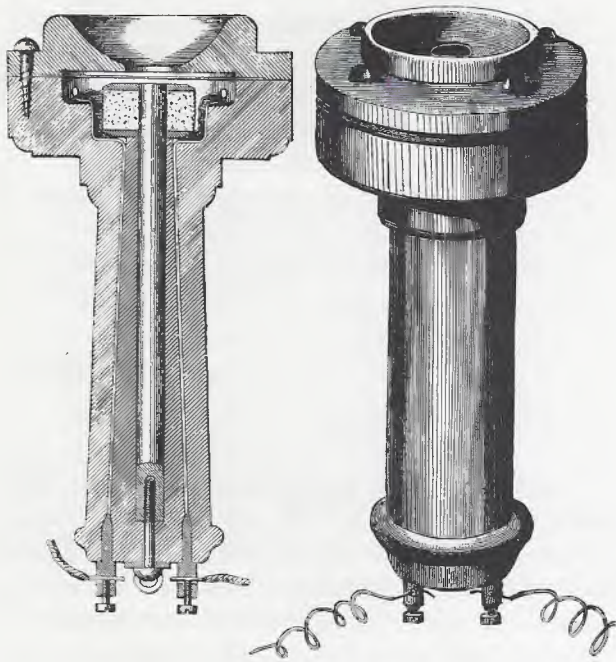
Section and exterior view of Bell's handset.

The nineteenth century was in many ways the era of the amateur inventor. The body of knowledge that was science and technology in the latter part of the last century was not so extensive and specialised as it is today, and many part-time experimenters made significant contributions. A teacher of the deaf (Alexander Graham Bell), an undertaker (Almon Strowger) and a clergyman (The Reverend Henry Hunnings) all contributed in very important ways to the development of telephony.

Alexander Graham Bell published details of his telephone in the "Scientific American" on 6 October 1877, and enthusiasts in many countries made their own versions of the instrument from the description in this article. This was the case in Australia.

TASMANIA

One such enthusiast was Alfred B. Biggs, a self-educated man and a noted amateur astronomer. And while only an amateur, he did have several papers on scientific topics accepted by the Royal Society in London. He was head teacher of Campbell Town Public School in Tasmania from 1864 to 1874.

Guided by Bell's plans, he made several hand-type telephones from Huon Pine on his workshop lathe. He positioned them in Launceston and Campbell Town railway stations and transmitted the 80 km distance between these two points along the telegraph line which ran beside the railway.

His experiment was a complete success. It has been claimed by some to be the first occasion on which a telephone was actually used in Australia, although there is no conclusive evidence of this. The original sets are on display in the Queen Victoria Museum, Launceston.

The Cornwall Chronicle of April 1878 reported an experiment conducted in February of that year between the Launceston Telegraph Office and Low Head, using instruments made by Robert Henry, who later became the Superintendent of Telegraphs. His elegantly phrased telegram to Launceston gives a clear indication of the form the experiment took:

"The Song — 'Rocked in the Cradle of the Deep' — splendid, most perfect; cornet quite distinct, heard everything more or less. Altogether the experiment very successful"

He added a comment which proved to be an accurate prediction of the future:

The first telephone ever used in Victoria in 1877.

VICTORIA

As early as 1877, W. J. Thomas of the Geelong Customs House experimented with home-made telephones and successfully linked houses in his locality. By means of his telephones and wire, Thomas arranged for the transmission from one house to another of music as well as conversation. Social gatherings were arranged to try the telephone, which helped in testing and also provided a novel form of entertainment.

Later, Thomas transmitted over longer distances, using a telegraph line between Geelong and Melbourne and between Geelong and Queenscliff.

The first test between Geelong and Queenscliff took place on the evening of 9 January 1878. Some of the contributions were heard clearly, notably a vocal rendition of "Yankee Doodle" at the Geelong end of the line, and "Genevieve" at the Queenscliff end.

What appears to have been the first installation of a regular commercial telephone service in Australia came into operation on 2 January 1878. This was in Melbourne. It linked the head office of hardware importers Messrs McLean Bros. & Rigg in Elizabeth Street with their Spencer Street store — about 1.2 km away. The telephones used were made by a local man — J. S. Edwards.

In February 1878, successful experiments were carried out between Melbourne and Ballarat (115 km) using telephones made by a Mr Challon of the Central Telegraph Office, Melbourne.

The Victorian Post Office report for 1878 had this to say about the exciting developments in local telephony:

"The branch establishments of several business places in Melbourne and the suburbs are now connected with their head offices by means of telephones. The great drawback to the utility of these instruments when first introduced, was the difficulty of calling the attention of the person desired to be spoken to. This has been overcome by the attachment of signal bells to the wire, and the use of the telephones for business purposes has proved to be a great convenience. The greatest length of wire on which telephones are at present regularly employed is about 5 miles (8 km)".

NEW SOUTH WALES

E. C. Cracknell, Superintendent, Electric Telegraphs, in New South Wales was another to experiment. He was on an official visit to West Maitland in December 1877, and while in the area he successfully transmitted songs and music over the 224 km distance between West Maitland and Sydney using telegraph wires. G. A. Kopsch, of the Telegraph Department, who had the grand title of Chief Mechanician, was at the Sydney end. The instruments used were made after reading Bell's article.

SOUTH AUSTRALIA

Sir Charles Todd, famous for his building of the Overland Telegraph Line, said in a report to Parliament:

"We tried it here at an early date . . . and with telephones of the Bell type made in our own workshop, effected communication, first between Semaphore, Adelaide and Kapeenda, in January 1878, and subsequently between Semaphore and Port Augusta, a distance by wire of 240 miles (385 km). It was also tried most successfully on the Port Darwin line . . .
We also made several loud speaking Gower Telephones which worked admirably over long distances of line . . ."

It was C. A. Unbehaum, Electrical Engineer for South Australia, who carried out the actual technical work and the experiments.

WESTERN AUSTRALIA

The Superintendent of Telegraphs in Western Australia, J. C. Fleming, reported to the Parliament of that State on 5 April 1882:

"When first introduced in the form of a wooden hand-telephone (such as imported here about four years ago), the instrument could not be used with any beneficial result. It was more a pretty scientific toy, which exercised the imagination almost as much as the ear. It is now, however, and has been for some time, a reliable and practical instrument, especially when from the hands of Manufacturers of Reputation

. . . In America, in France and in Germany its success is unparalleled".

QUEENSLAND

It appears that the first experiments with telephones in Queensland were conducted at the Brisbane General Post Office on 26 January 1878 by W. J. Cracknell, Superintendent, Telegraphs and brother of E. C. Cracknell of New South Wales.

He used roughly-fashioned telephones for the experiments. However, he said they were not well adapted for the purpose, even though fair results were obtained. He had evidently corresponded with Bell. In his report to Parliament on 11 March 1878, Cracknell said:

"Professor Bell, the inventor of the Telephone, is sending me two of his improved instruments, and on their arrival further experiments with this scientific wonder will be made".

The Brisbane Courier of February 1878 reported that on 28 January 1878, a Dr Severn successfully experimented with telephones over a mile of telegraph wire beginning at the Electric Telegraph Office at the Brisbane GPO. The same day a call was made via Ipswich and return using 80 km of wire.

Motivated by this success, circuits were set up to Toowoomba and even to Rockhampton. In February 1878, the inland route was combined with the coastal route to make up 1600 km of telegraph lines and speech was transmitted successfully.

"Social gatherings were held to try the telephone . . ."
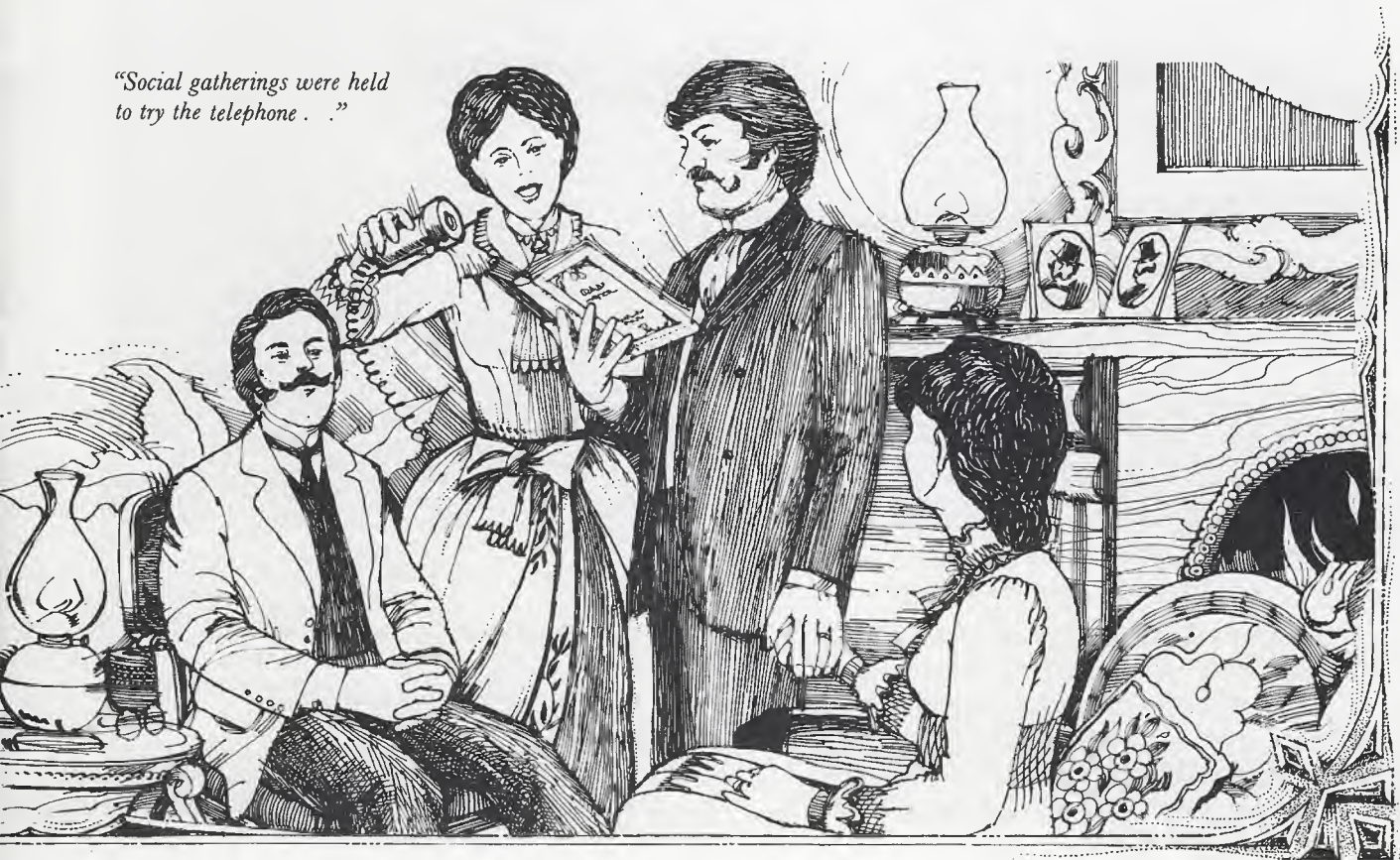
These early telephones were used for communication between two fixed points — for example, in a business between its warehouse and its factory. The instrument generally consisted of two Bell telephones — one receiving and the other transmitting.

But January 1878 saw another big advance in the technology of the telephone system. This was the opening of the first commercial telephone exchange in Connecticut in the United States.

The development of the exchange was a logical step. If the existing point-to-point connections had just been extended, then it would mean that each user would need lines running from his telephone directly to those of all other users he wanted to be able to talk to. Such a system would rapidly become unworkable. Instead, the exchange enabled a 'subscriber' to replace these many wires with a single set of connections between his instrument and the exchange — a central switching office through which his line could be connected with that of any other 'subscriber' to that exchange.

Contact with the exchange was made when the caller lifted the receiver from its hook and operated a signalling device to alert the operator at the exchange that he wanted to make a call. He would then tell the operator the number of the person to whom he wanted to speak, and the operator would make the appropriate connection between the two lines, after first making contact with the person being called. Electric current to make contact with the exchange was provided by a hand-wound magneto which was part of the telephone instrument.

AUSTRALIA'S FIRST EXCHANGES

Australia's first telephone exchange was opened in Melbourne in August 1880. It was operated by the Melbourne Telephone Exchange Company. Owned by W. H. Masters and T. T. Draper, the Manager of the Company was H. Byron Moore.

"The Australasian Sketcher", January 1881 wrote of the new Melbourne Telephone Exchange:

". . . of its utility there can be no two opinions. As an invention which will enable a man sitting in his own office to ask his bank manager for an overdraft, order a coat from his tailor, and send his wife any reasonable excuse for his non-appearance at home at the usual hour, deserves a first class certificate in the direction of usefulness . . ."

Melbourne Telephone Exchange Company, LIMITED

H. BYRON MOORE, MANAGING DIRECTOR.   T. T. DRAPER, SUPERINTENDENT.

THE TELEPHONE secures ECONOMY OF TIME, MONEY, AND ENERGY.
TELEPHONE EXCHANGES are now established in all the PRINCIPAL CITIES OF THE WORLD, and are regarded as ESSENTIAL to the EASY AND SPEEDY TRANSACTION OF BUSINESS.

LIST OF SUBSCRIBERS

63. Adelaide Marine and Fire Insurance Co.
49. "Age," The, Newspaper Office.
125. Aitken, Thomas, Brewer.
79. Alford and Co., Merchants.
107. Alfred Hospital.
3. Alliance British and Foreign Life and Fire Assurance Company.
15. Andrews, W., Importer of Glass and China.
17. Apollo Stearine Candle Company.
4. Arnold and Co., George, Wool Brokers.
23. Australian Alliance Assurance Company.
81. Alcock and Co., Timber Merchants and Billiard Table Manufacturers.
92. Australasian Mortgage and Agency Company.
32. Bank of Australasia, The.
87. Bank, Colonial.
118. Bank, National.
66. Bank of New Zealand, The.
59. Bank, The City of Melbourne.
31. Bank, The Commercial of Australia.
91. Bank, London Chartered, Head Office.
95.   Do.   do.   Bourke Street East.
80.   Do.   do.   Carlton.
118. Bank, National.
10. Beath, Schiess and Co., Warehousemen.
97. Beauchamp and Son, Auctioneers, Melbourne.
7. Blake and Riggall, Solicitors.
57. Bones and Watt, Printers.
35. Briscoe and Co., Ironmongers and Iron Merchants.
3. Canton Insurance Office.
82. Collins, McPetrie and Ogilvie, Wool Dumpers.
91. Colonial Mutual Life Assurance Society, Limited.
91. Colonial Mutual Fire Insurance Company, Limited.
29. Commercial Union Assurance Company.
9. Connell, Hogarth and Co., Merchants.
42. Cook, Thomas, and Sons, Tourist Agents.
71. Coombs' Trade Protection Society.
64. Cowan and Co., Wholesale and Manufacturing Stationers.
111. Crisp, Lewis and Hedderwick, Solicitors.
18. Crosby, W., and Co., Merchants and Shipping Agents.
92. Cunningham and Co.
61. Currier and Adet, Wine and Spirit Merchants, Importers.
70. Custom House.
113. "Daily Telegraph" Newspaper.
121. Danks, John, Brassfounder.
62. Dalgety, Blackwood and Co., Merchants, &c.
50. Davey, Cole and Flack, Trade Assignees, &c.
5. Derwent and Tamar Fire and Marine Assurance Company.
72. Detmold, William, Wholesale Stationer, Bookbinder and Manufacturer.
80. De Castella and Rowan, St. Hubert's Wine Cellars.
21. Derham and Co., Grain Merchants.
6. Dixon, W. F., Music Warehouse.
55. Eeroyd, Danby and Gilmour, Accountants, Trade Assignees, &c.
31. Elder, David.
56. "Evening Herald" Office, The.
44. Exchange, The Manager of the.
2. Exhibition.
5. Fanning, Nankivell and Co., Merchants.
36. Fergusson and Moore, Printers.
106. Fire Insurance Companies' Brigade Association.
93. Fitzgerald, T. N., Surgeon.
16. Francis, Henry, and Co., Chemists and Druggists.
73. Fraser and Co., Auctioneers, &c.
99. Gemmell, Tuckett and Co., Auctioneers.
85. Gibbs, Bright and Co.
63. Godfrey and Bullen, Attorneys.
52. Goldsbrough, R., and Co., Wool Brokers, &c.
78. Greig and Murray, Auctioneers, &c.
112. Ham, C. J. and T., Auctioneers and Estate Agents.
3. Henty, James, and Co., Merchants.
107. Hospital, Alfred.
101. Hospital, Melbourne.
116. Imperial Marine Insurance Company, Limited, 44 Queen Street.
13. James, E. M., Surgeon.
69. Jeffray, R. J., Private Residence, Toorak.
11. Jeffray, R. J., Private Office.
22. Jones, W. B., Bend and Free Storekeeper.
22. Jones, W. B., and Son, Machinery Merchants.
119. King, Harcourt and Williams, Warehousemen and Importers, Hotham.
36. Kitchen, J., and Sons, Stearine Candle and Soap Manufacturers.
22. Knight, R., and Co., Wooldumpers and Carriers.

110. Lange and Thoneman, Importers.
25. Liverpool and London and Globe Insurance Company.
88. Lloyd, J. C., Insurance Broker.
116. London Guarantee and Accident Company Limited, 44 Queen Street.
27. Lyell and Gowan, Merchants, and General Commission Agents.
91. Martin, T. Jaques, and Co., Insurance Agents.
46. Massina, A. H., and Co., Printers and Publishers.
39. Masters, W. H., and Co., Importers.
75. Mason, Firth and McCutcheon, Printers.
121. Melbourne Brewing and Malting Company.
51. Miller, Jas., and Co., Rope, Jute, and Mat Manufacturers
42. Moore, H. Byron, Office, Exchange.
      Moore, H. Byron, Private Residence, Ascot Vale.
26. Moss, Henry, Ship and Steam Tug Owner and Lighterman.
67. McCarron, Bird and Co., Printers and Publishers.
11. McCulloch, Wm., and Co., Carriers.
18. McEwan, James, and Co., Ironmongers, Metal Merchants, &c.
20. McLean Bros. and Rigg, Importers of Hardware, Ironmongers, &c.
86. Mullen, S., Bookseller and Stationer.
117. Mutual Store.
89. McArthur, Morrow and Brind, Warehousemen.
109. Morley and Co., Cartage Contractors.
24. Newell and Co., Merchants.
34. New Zealand Loan and Mercantile Agency Company, Limited.
8. North German Fire Insurance Company.
116. Norwich Union Fire Insurance Society, 44 Queen Street.
116. Omnibus Company, Head Office.
      Do.   do.   St. Kilda.
      Do.   do.   Richmond.
63. Parsons, C. R.
45. Paterson, Laing and Bruce, Warehousemen.
76. Porteous and Gaband, Brush Manufacturers.
127. Renard Brothers.
126. Rubertson, Dr., Collins Street.
60. Roberts, Morris and Deakin, Iron and General Merchants.
1. Robison Bros. and Co., Engineers, Brassfounders, &c.
19. Rocke, W. H., and Co., Furniture, Carpet and Bedstead Warehouse.
84. Rolfe and Co., Merchants.
83. "Red Cross" Preserving Co.
68. Sanderson, John, and Co., Wood Merchants, &c.
38. Sargood, Butler and Nichol, Warehousemen and Importers.
122. Scott's Hotel.
120. Scourfield and Coultas, Tailors, Collins Street East.
14. Service, James, and Co., Merchants.
100. Sherar and Gillespie, Stationers.
113. Summons, J. D., 86 Collins Street East.
37. Sloane, Wm., and Co., Stock and Station Agents.
65. Smith, Wm. Howard, and Sons, Shipowners and Coal Merchants.
113. Sommerton, C. F., 86 Collins Street East.
63. Southern Lloyd's.
63. South British Fire and Marine Insurance Co. of New Zealand.
108. Sprigg, W. G.
91. Standard Fire and Marine Insurance Company New Zealand.
114. Sutherland, Alex., and Co., Iron Merchants.
21. Swallow and Ariell, Biscuit Manufacturers.
91. Swiss Lloyd Marine Insurance Company.
49. Syme, David, and Co., the "Age" Office.
128. Tar Paving Company, The.
17. Taylor, Lloyd, Architect.
116. Taylor, R. Manfield, Insurance and Financial Agent.
39. Telephone Exchange Superintendent, Little Collins Street West.
71. Trade Protection Society (Coomb's).
58. Turner, James, and Son, Stock, Station, and Wool Agents.
30. Walker, Thomas, Wharf Agent and Contractor.
28. Walker, W. F., Kerosene Bonded Stores.
123. Watson, John, Insurance Broker, &c.
12. Wertheim, H., Importer Sewing Machines, &c.
64. Wisewould and Gibbs, Solicitors.
90. Wright and Edwards, Engineers and Founders.
116. Yencken, E. F., 44 Queen Street.
33. Zevenboom, John, Brush Manufacturer.

#### PLEASE CANCEL PRIOR LIST.

Subscribers to the Telephone being Members of the Exchange can use the Telephone in the Exchange.

SPECIAL NOTICE—In the event of FIRE, Subscribers are requested to TELEPHONE for the FIRE BRIGADE, which will AT ONCE ATTEND.

Should any difficulty arise on the lines, please report immediately to the Superintendent, No. 39.

JUNE 22nd, 1881.

An early telephone directory.

"The Sketcher" referred to the Melbourne Telephone Exchange as *"The Palace of Winged Words"*, and said:
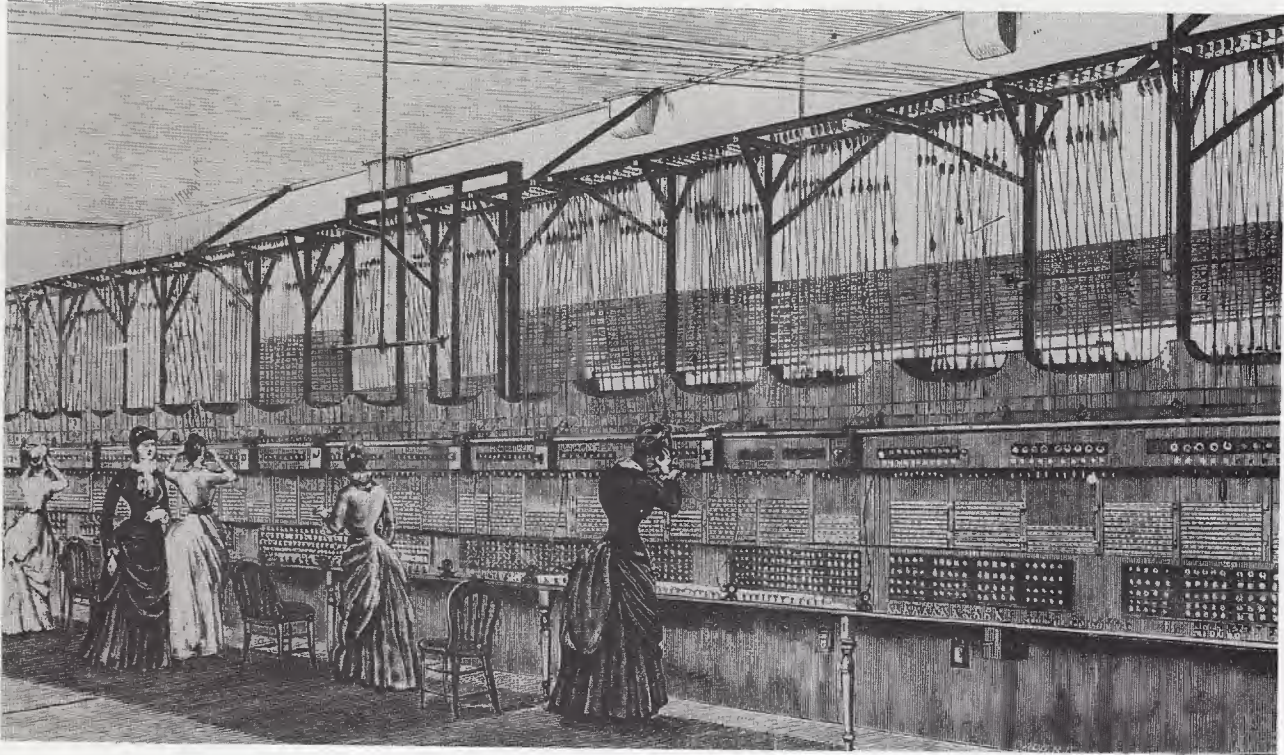
Switch-room of the Victorian Telephone Exchange Company in Wills St, in about 1886.

Trainee telephonists in the early 1900s being given lessons in voice production.

". . . at present over 70 subscribers have sent in their names to the Melbourne Exchange list . . . each subscriber has in his office or house, fitted against the wall, on the mantel piece or in any convenient place, a small box containing the wire, attached to which are two wires ending severally in an ear and mouth piece, while on the board in the central office are a button or peg and a little brass plate like the outside of a Brahmah lock, with his number attached. It is at this board, presided over at present by two young ladies, that the important operation of 'switching' or connecting the two persons desirous of talking, is conducted."

This was only two years after the world's first exchange in the United States, and just four years after Bell first spoke on a telephone.

The exchange was located in the old Stock Exchange building at 367 Collins Street, a site now occupied by the Commonwealth Bank. In 1884, the operations of the Company, by then known as the Victorian Telephone Exchange Company, had grown considerably and were transferred to Wills Street, Melbourne.

Private ownership of this company continued until 1887, when it was bought out by the Victorian Colonial Government. Other colonial governments followed this example.

Byron Moore commented:

"The Government, which had looked on us as idle dreamers, soon became jealous of our success and seven years later, most unworthily squeezed us out . . ."

At the time of the Government take-over in September 1887, there were 887 subscribers and the Company had 21 employees. The following year the number of subscribers was 1,462.

The "Town and Country Journal", of 10 September 1887, commented on the Wills Street Exchange:

"The operators stand up when attending to subscribers' calls, chairs being, however, provided for the leisure moments of the fair and nimble-fingered battalion of operators. There are in all twenty-four lady operators employed in the Exchange, the time-table being so arranged as to provide eleven always in attendance at the switchboard . . ."

"Place yourself in the middle of the room and gaze upon the delicate hands in magic confusion playing as it were upon metal switches, plugs and switching cords. There is no shouting or even excitement — no apoplectic strain into the machine's mouth. The young ladies rarely turn their heads. There is a soft sighing murmur in the room: and one could easily imagine the spare forms to be automatic figures; and yet that little pouting delicate mouth is wrestling with the pangs, groans and tempers of 100 subscribers, that number being attended to by one lady operator . . ."

Sydney's telephone exchange in the 1890s.

The ladies of the Brisbane telephone exchange, June 1899, with their Supervisor, Mrs Dick (centre front row).

Port Adelaide exchange in the early 1900s.
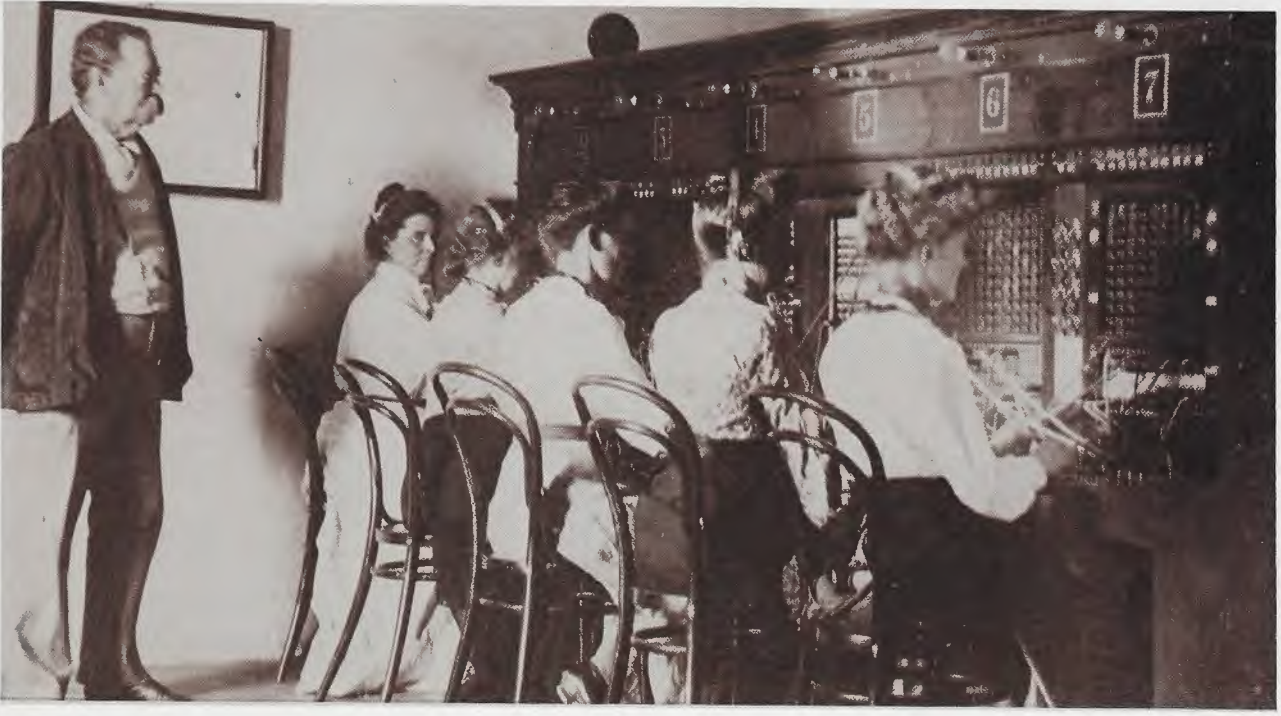
By 1910, the growth in telephone services made additional accommodation necessary. This could not be provided in the existing building in Wills Street and arrangements were made for a new exchange in Lonsdale Street.

Alexander Graham Bell made a visit to Australia in 1910 in order to advise the Federal Government's Postal Commission and a reception was held for him at the new Lonsdale Street Exchange.

The Lonsdale Street Exchange was changed over in August 1911 to the Central Battery system, following its introduction to Hobart in 1907. This system overcame the need for separate batteries at each user's premises. Instead, power was provided by a powerful set of batteries at each exchange.

In New South Wales the directors of the Royal Exchange were responsible for the establishment of the first permanent telephone connection and the first Sydney telephone exchange.

The Royal Exchange was a group of merchants and businessmen who gave Sydney many of its business institutions and innovations, such as the Stock Exchange. It had also established the first telegraph link in New South Wales back in the 1850s.

In 1880, the Royal Exchange wanted to run a trial line from the Exchange Building in Bridge Street to
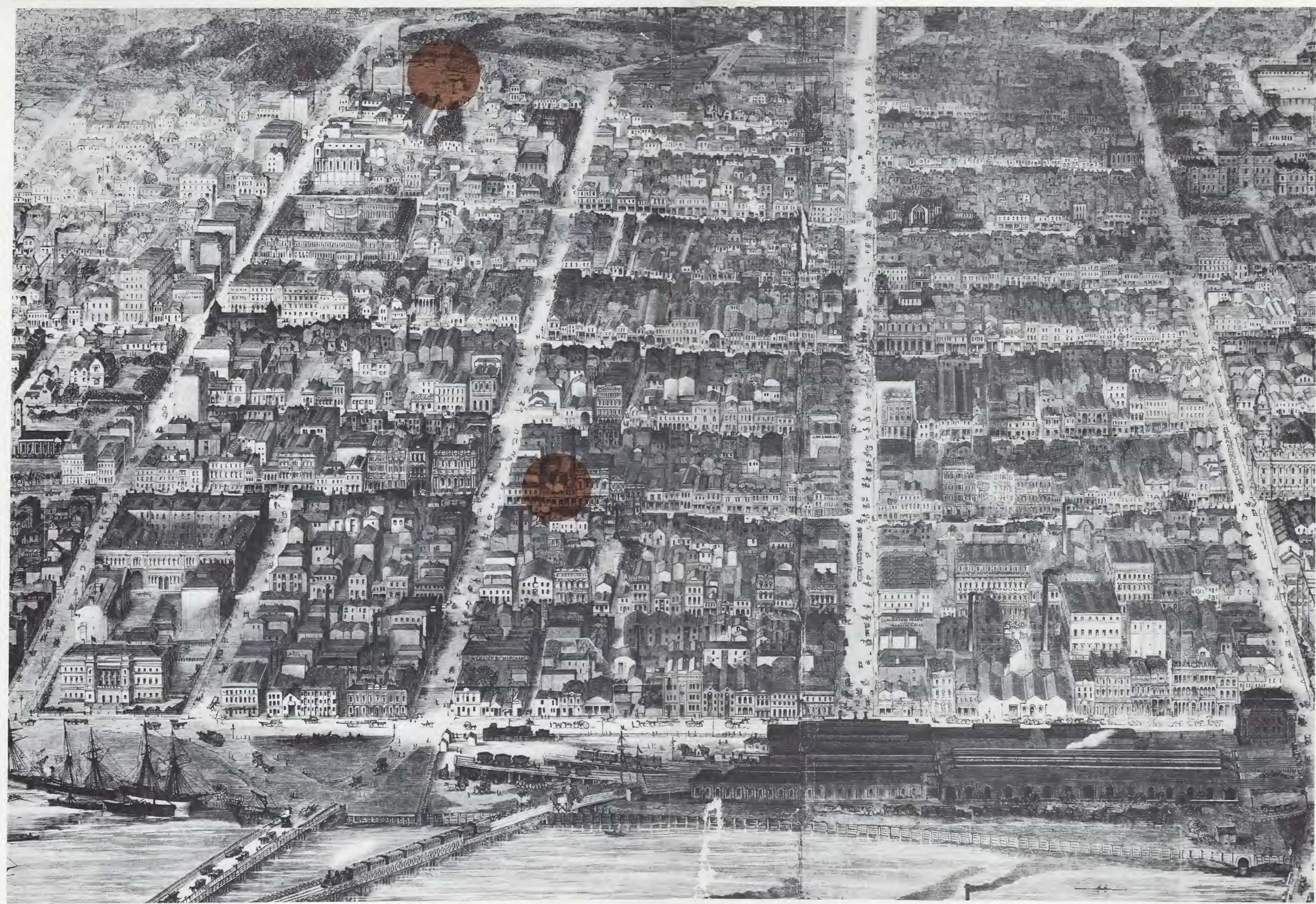
Melbourne in 1880, the year of the first telephone exchange.

LEGEND: Lower circle shows approximate site of Collins Street exchange.   Upper circle shows location of the later Wills Street exchange.

GPO telephone exchange in Perth, 1912.

the GPO in George Street to give Sydney businessmen a chance to try out the telephone for themselves. In order to set up this trial line, the directors of the Royal Exchange needed the co-operation of the Superintendent of Telegraphs, E. C. Cracknell, since the telegraph poles would be needed to run the telephone line.

While Cracknell had been one of the first to experiment with telephones in New South Wales, according to reports he was not entirely co-operative with these early attempts to establish a commercial telephone system in Sydney. He is quoted as calling Bell's telephone a *"Yankee Toy"*. However in the end, after some pressure the Superintendent of Telegraphs was won over and a trial line was set up between the Exchange and the GPO on 6 August 1880.

The Sydney Morning Herald reported how it happened:

> *"Mr F. R. Wells, the local agent for the invention, fitted up one of the Edison-Bell telephones yesterday at the Sydney Exchange and a fellow one at Mr Cracknell's room at the General Post Office ... During the day almost everyone who entered the Exchange touched the communicator so that Mr Cracknell, Mr McGuire and Mr Wells, who relieved each other at the other end were kept employed answering queries, many of which were of a rather silly nature."*

The newspaper went on to say that the telephone *"offers great convenience to businessmen and the project is likely to be taken up."*

It was taken up. On 1 November 1880 the telephone officially arrived in Sydney when the first permanent telephone line was installed from the Darling

Telephone exchange staff at Atherton, Queensland in 1911.

Harbour Goods Yard to the Royal Exchange in Bridge Street in the city.

There were soon several telephone connections into the Royal Exchange but there wasn't yet a switchboard or exchange as we know it today. But in 1881 a switchboard arrived from America and from that point the subscribers could talk to each other as well as to the Royal Exchange.

Hobart Central Battery exchange in 1923.

Early telephone subscribers to the Royal Exchange had to pay for all the installation charges for their telephone services, including putting up the pole line and the cost of the receiver. They also had to pay 5 pounds a year for line maintenance, at the time an enormous sum of money. But once the telephone subscriber had paid these bills then he owned both the line and the telephone and could make as many calls as he wished without any charge.

In 1882 the Postmaster-General's Department opened its own telephone exchange in the GPO. So, for a short time in Sydney there were two separate telephone exchanges operating.

Percy Howe was the first switch attendant in the PMG exchange. He recalled that there were only ten subscribers when it opened, and on that first day there was only one telephone call. It was from a subscriber asking the switch attendant how he was getting on!

In 1883 the Postmaster-General's Department took over the Royal Exchange telephone exchange after several troubles there including a fire in the switchboard.

In Brisbane, Government offices were given telephone links in October 1880, through a central exchange at the GPO. By 1881 there were 36 telephones connected to the exchange, including a number of private ones. The Mechanician was a Mr Starke. He tested the privately-owned telephones before installation — they cost 10 pounds each.

The exchange operator was Fred Watson, who later became Manager of Telephones. He provided service between 9 am and 6 pm. By 1883, continuous service was being provided and 175 telephones had been connected to the exchange.

In 1889, building alterations were made to provide for the introduction of female telephonists. A Mrs Dick was appointed Supervisor over 13 girls. They worked from 8 am to 6 pm — then male operators worked the night shift.

In 1882, the telephone system moved inland and the first country exchange in Australia was opened at Maryborough, Queensland, with 32 subscribers.

The following year telephone exchanges were established in Adelaide (48 subscribers), Hobart (10 subscribers) and Launceston (35 subscribers).

The first exchange in Western Australia, established in 1887, was located in a small three-room cottage in Wellington Street, Perth with 17 subscribers. The year 1888 marked the opening of the Fremantle exchange in a small room at the rear of the Town Hall. There were nine subscribers.

Around this time Mark Twain, the American humourist, evidently having had trouble with inconvenient telephone calls, said of the new-fangled invention:

"It is my heart-warm and world-embracing Christmas hope and aspiration that all of us — the high, the low, the poor, the rich, the admired, the despised — may eventually be gathered together in a heaven of everlasting rest and peace and bliss — except the inventor of the telephone."

The System Goes Automatic

For the late 19th century telephone system to take on the features by which, more or less, we know it today, one more stride forward in technology was needed. The system had to go 'automatic' — otherwise an enormous workforce would have been needed to switch a multitude of calls manually.

The man to make this revolutionary advance in telephony was a Kansas undertaker, Almon B. Strowger. In 1889, he filed a patent for a method of automatic switching; one more example of a contribution to the technology of the telephone by a gifted outsider.

Legend has it that he was concerned to eliminate manual exchanges because he believed that the operators on the city switchboard had been diverting calls from next-of-kin about deaths to his business rivals, who were able to get in ahead of him with their sales talk.

Whether Strowger was justified in his suspicions is not known. But he was obviously an ingenious man.

He is said to have sat down with a cardboard collar box, some matches, a row of pins, and worked out the theory of an automatic switching system.

The system involved electrical contacts leading to other telephone subscribers on the inner surface of a cylinder. An arm on a central shaft was set so that it could be moved step-by-step up the inner side of the cylinder and then step-by-step across it until it reached the correct contact.

After some years, Strowger was able to perfect a piece of electro-mechanical technology which eventually made it possible for modern telephone systems to cope with millions of subscribers, few of whom would ever be able to talk to one another if they had to wait for operators to connect their instruments manually.

But automatic switching, at first, was by no means accepted speedily or with enthusiasm. For the introduction of the automatic exchange dispensed with the services of many telephone operators, and threw the

Laying the first underground cable in Geelong, 1912.
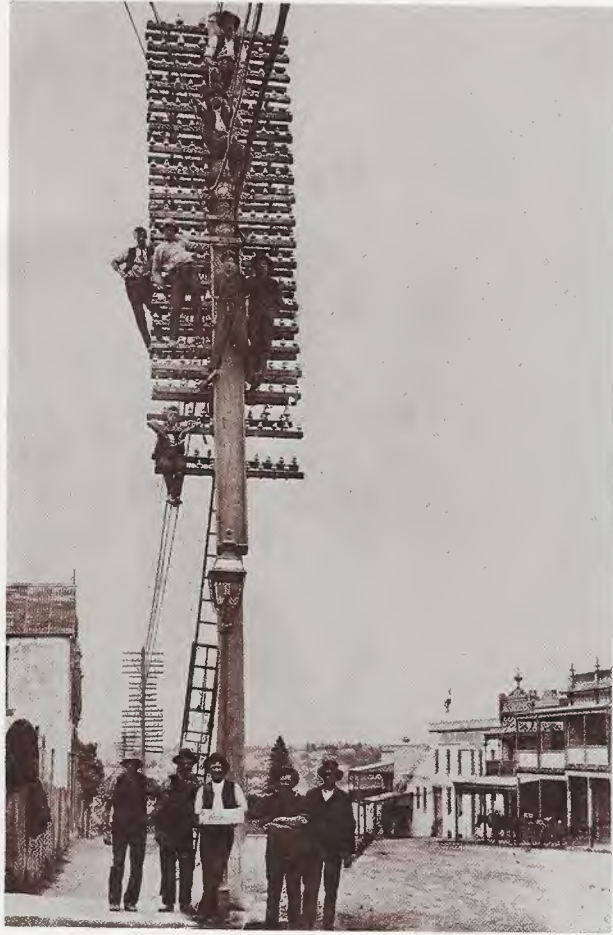
With the increasing popularity of the telephone, poles became overloaded with wires (Sydney, about 1912).

burden of selecting the line required onto the user. In other words, the user now had to select the required number himself, by using a dial or other mechanism.

Apparently the experts of the time had no great confidence in the capabilities of the telephone user. One J. E. Kingsbury wrote in 1915:

"The supervision of a telephonic connection has been regarded since 1887 as the essential duty of operating staff at the central office. In the automatic system supervision finds no place. The connecting mechanism is an automaton and the 'working of the figure' is dependent on the 'pulling of the wires'. Can the

Victorian telephone workshop, 1910.

Although the initial progress of automatic exchanges was slow, it was steady and relentless. Eventually, automatic switching was seen as inevitable, and growth became rapid. Strowger's step-by-step system was adopted around the world, and refined over the years. His system held its own against other forms of switching until the middle of our century, when advances in electronics meant it would be replaced by faster and more compact equipment.

AUSTRALIA'S FIRST AUTOMATIC EXCHANGE

Australia's first automatic exchange was installed in the GPO in Sydney, in 1911, for internal use. But the first automatic exchange for public use was opened at Geelong in Victoria in the next year — in July 1912. It had 800 subscribers.

The "Geelong Advertiser" described its local exchange in these terms:

"Nothing could be nearer human: to see it work and grasp what it does, makes it seem supernatural. It is so ingenious as to almost beggar complete description".

This Geelong exchange was the first automatic exchange in the Southern Hemisphere and the second in the then British Empire — it was preceded only by the Epsom Exchange in England.

Melbourne's first automatic exchange was opened in the suburb of Brighton in 1914; the first public automatic exchange in NSW began operating at Newtown, Sydney in 1915; and Queensland's first was installed at South Brisbane in 1925.

1929 saw the opening of Tasmania's first automatic exchange in Hobart. In September 1935, Ross became the first country district in Tasmania to have

*Cable hauling — Perth to Fremantle, Western Australia, 1916.*

an automatic telephone service. In June 1977, the manual telephone exchange at Swansea was replaced with an automatic service and made Tasmania the first State in Australia to have a fully automatic network.

FEDERATION IN AUSTRALIA

By 1901, when the six Australian States decided to federate, there were 32,767 telephones in use. Each of the States had, until then, built up its own telephone
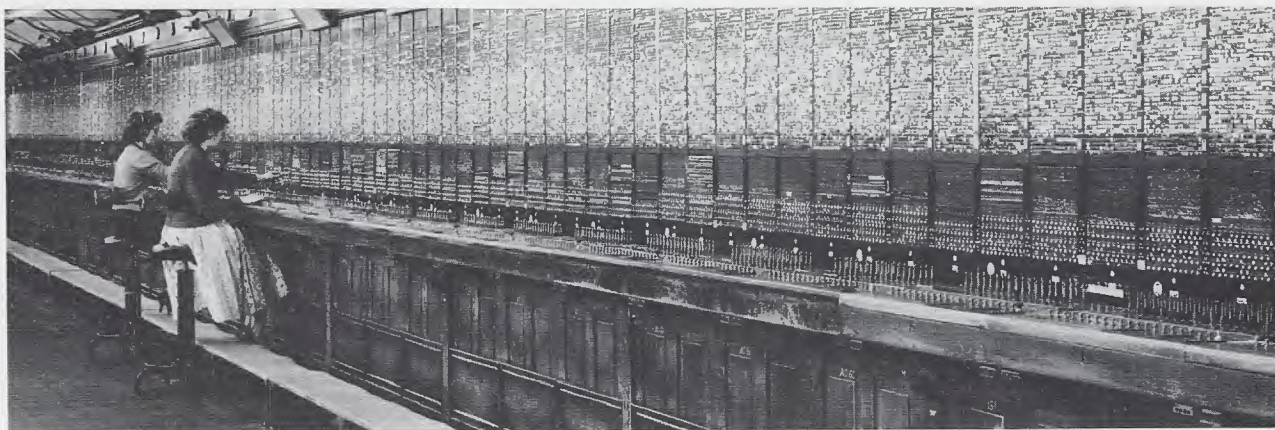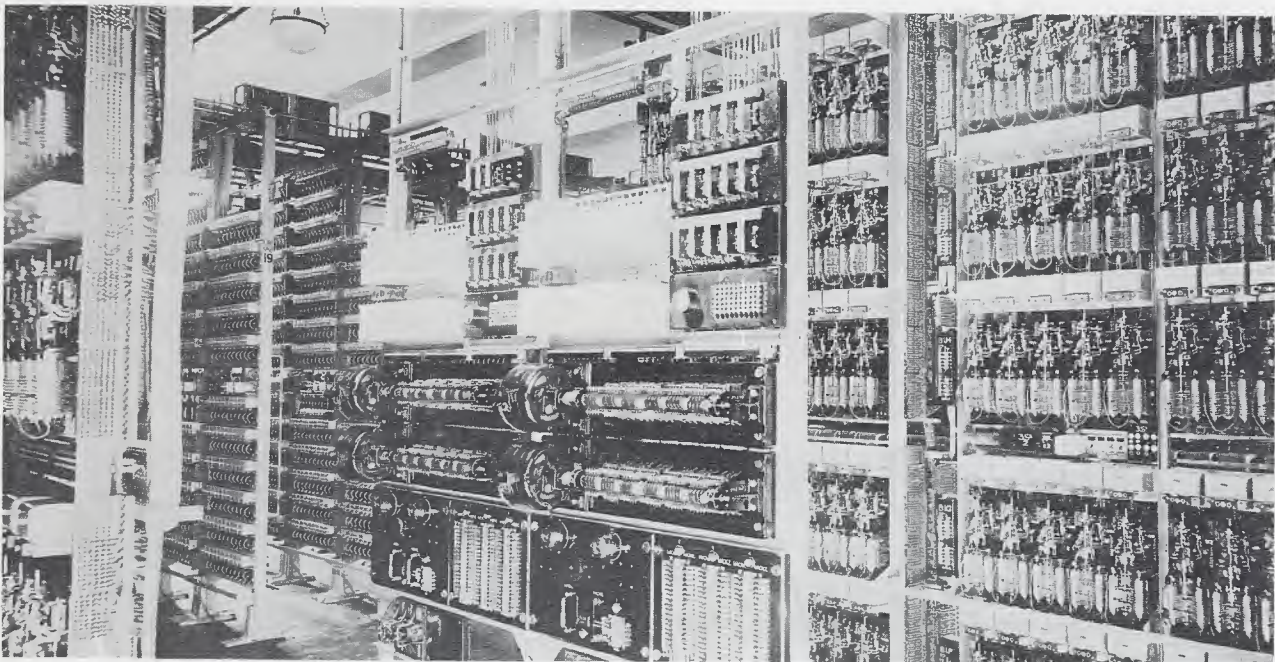

The last day of the Lonsdale St manual telephone exchange, Melbourne 1958.
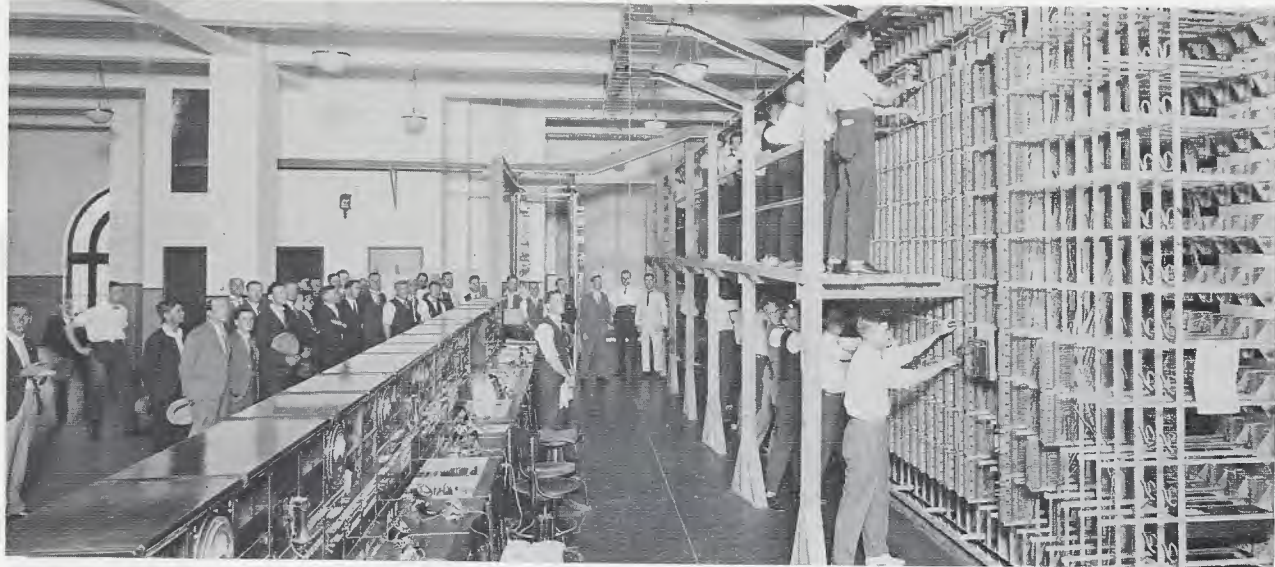
Preparing to switch over to the automatic exchange in Brisbane 1929.

Early automatic telephone exchange in Queensland.

services. But Federation brought all telecommunications under the control of the Federal Postmaster-General.

In 1911 there were 100,000 telephones in use. The rapid growth in the number of services reflected the growing popularity of the telephone as a means of reliable communication and the steady progress which the Post Office was making in the field of telephony.

The half-century following Federation saw the growth of automatic operation; a great extension of trunk line services; the introduction of radio, which was adapted to aid the expansion of the telephone service in several ways; and an enormous increase in the number of telephones in use. The more people who could be contacted by telephone, the more valuable

and useful the telephone system became, so increasing the demand still further.

The automatic telephone contributed greatly to the early popularity of telephones in Australia. It was a quicker and more convenient way of communicating with another person on the same exchange — instead of having to go through tedious processes with the operator. From its introduction, the number of automatic telephones in operation grew to a remarkable extent.

Today, Australia has more than 4000 automatic exchanges and it is planned to make the entire system fully automatic by 1990.

All metropolitan services are now automatic and recent years have also seen considerable increases in the number of rural automatic exchanges.
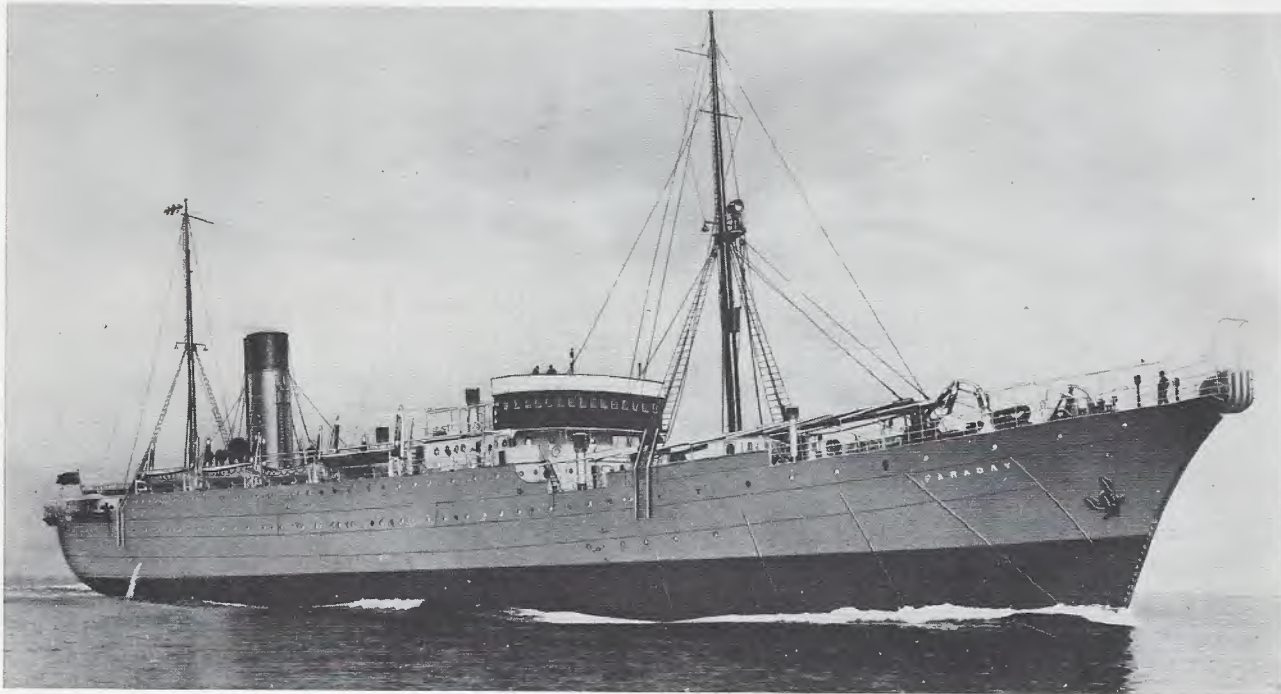
The cable ship 'Faraday' laying submarine cable across Bass Strait.

In August 1885, the construction of the world's first commercial long-distance telephone line between New York and Philadelphia began. It made clear that people connected to one exchange could also speak to those who were connected to distant exchanges.

Australia was quick to make use of this new development; in 1886, the first trunk link — a 16 km line — connected the exchanges of Adelaide and Port Adelaide in South Australia.

Then, in 1907, the first inter-capital telephone trunk line was opened between Sydney and Melbourne. It was followed by a line between Melbourne and Adelaide in 1914. Sydney and Brisbane were linked in 1923, and Perth and Adelaide in 1930.

In 1930, the first overseas calls from Australia became possible with the introduction of a radio-telephone service to England, and through there to Europe and America. A similar service opened to New Zealand in the same year.

Initially, trunk channels linked different manual trunk exchanges. It was necessary for a succession of trunk operators to connect the appropriate channels together, one after the other, until the connection was made. As trunk traffic grew, the system became in-
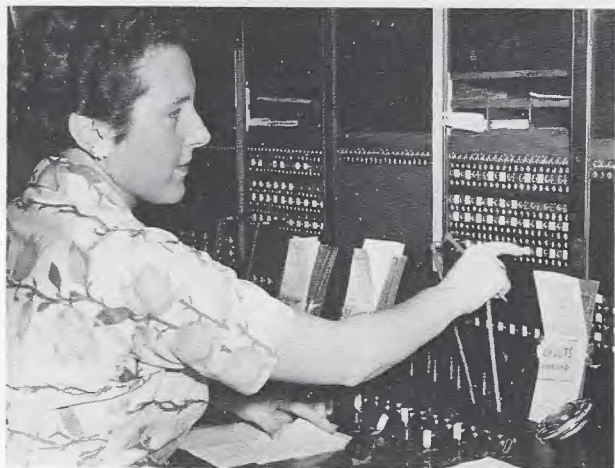
The first radio-telephone call is connected between Perth and London in 1930.

creasingly unsuitable. More trunk operators had to be employed and so labour costs increased. It was a tedious and slow way of making a long distance call, and it was sometimes hard to hear, particularly when several exchanges were linked.
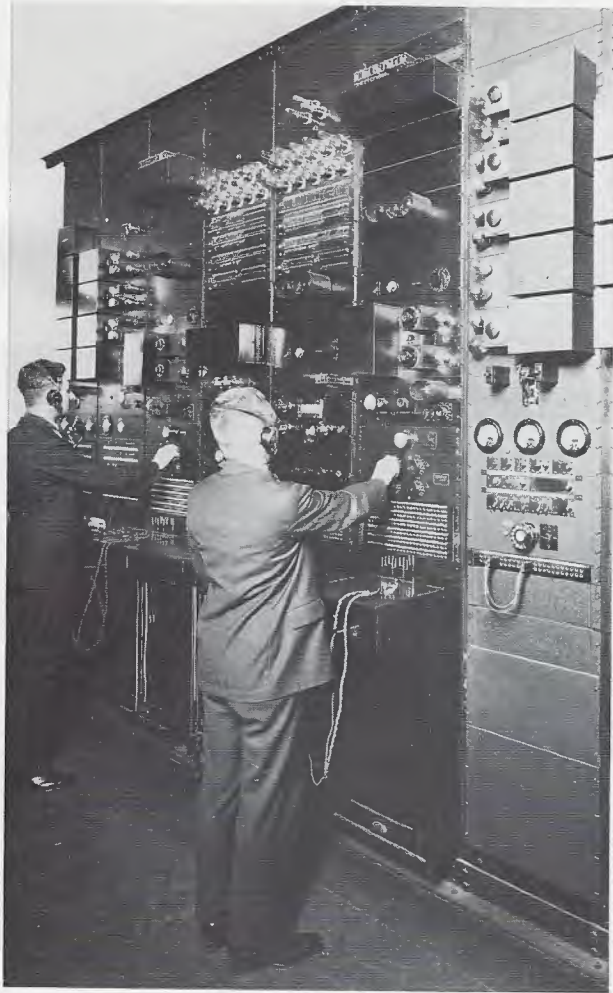
*Test room, overseas telephone service, Sydney 1933.*

With technical advances, trunk switching moved from manual operation through a partly automatic phase. Automatic transit switching equipment was used and only a single operator was required to connect a trunk call to a wanted automatic subscriber. Until well beyond the middle of this century, the majority of trunk traffic went through this single telephonist control.

In 1953, the number of telephones in use in Australia passed the one million mark. By then, the need for improvement in the automatic exchanges was becoming well recognised. The need was for a telephone switching system which would do a better job more economically than the conventional step-by-step exchange which, basically, still followed Strowger's principles.

This led to the adoption of the Crossbar system as the standard in automatic telephone exchanges. The first major installation of this type of equipment was at Toowoomba, Queensland, where a 6,300 line automatic telephone exchange began service in September 1960.

The introduction of Crossbar switching was a big step forward in the automation of trunk calls. It substituted automatic switching and charging equipment for the originating trunk operator, and improved the quality of the system radically. Prior to the introduction of Crossbar, there were often very long delays in obtaining a booked trunk call, and the quality of sound was often very poor.
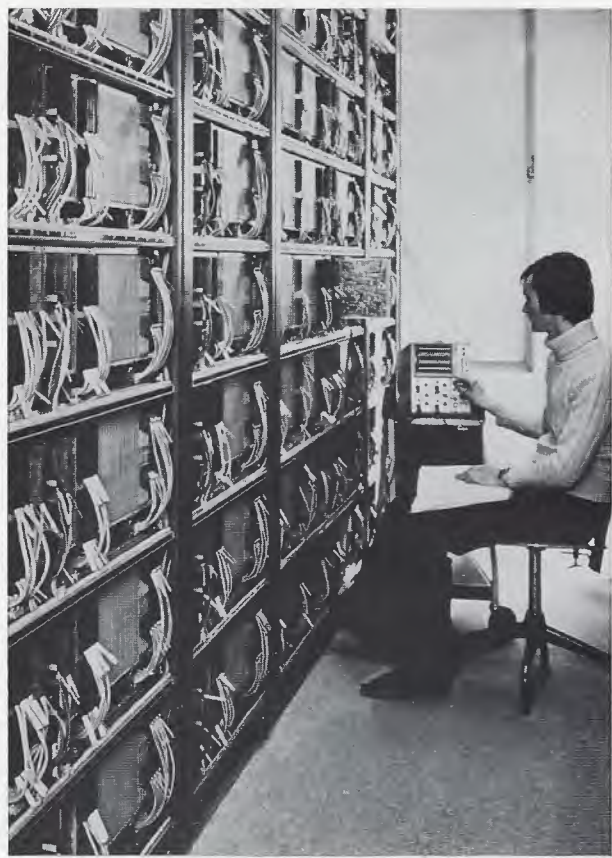
The new Crossbar exchanges had an electrical
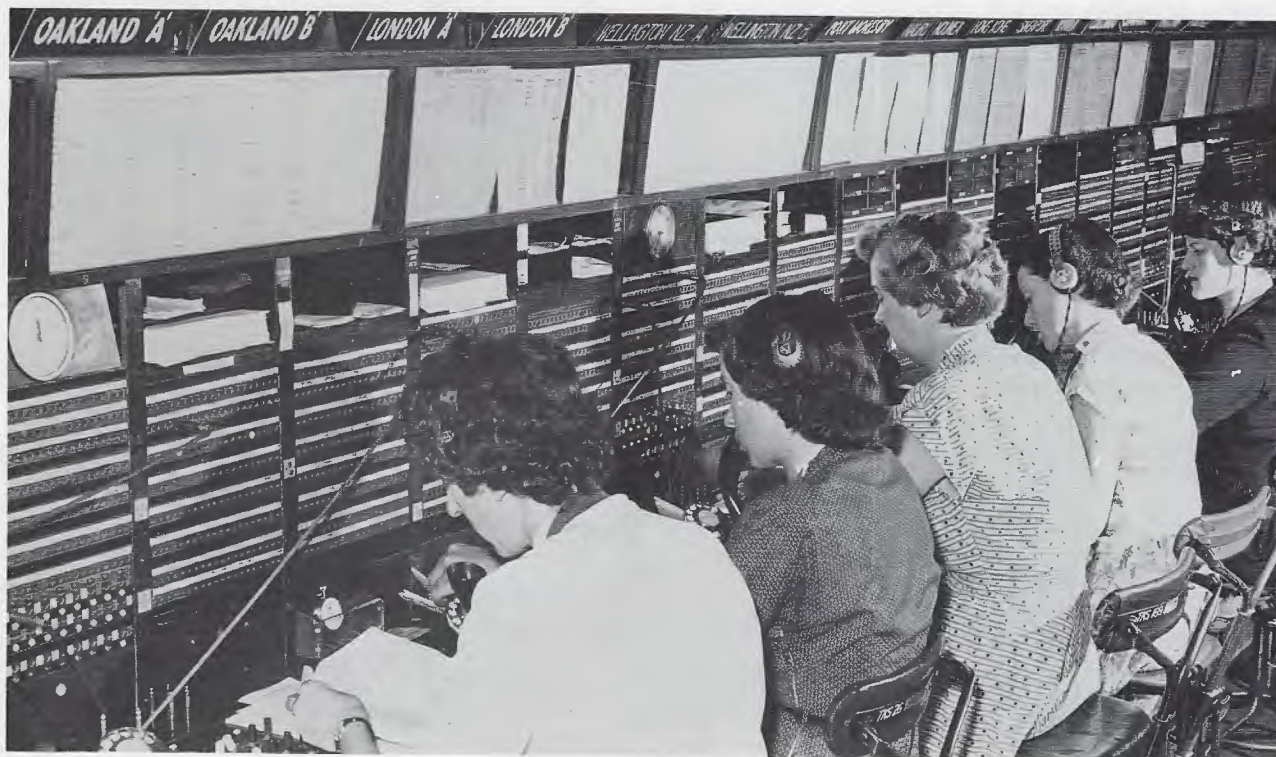
International trunk-line switchboard in Sydney, 1952.

19
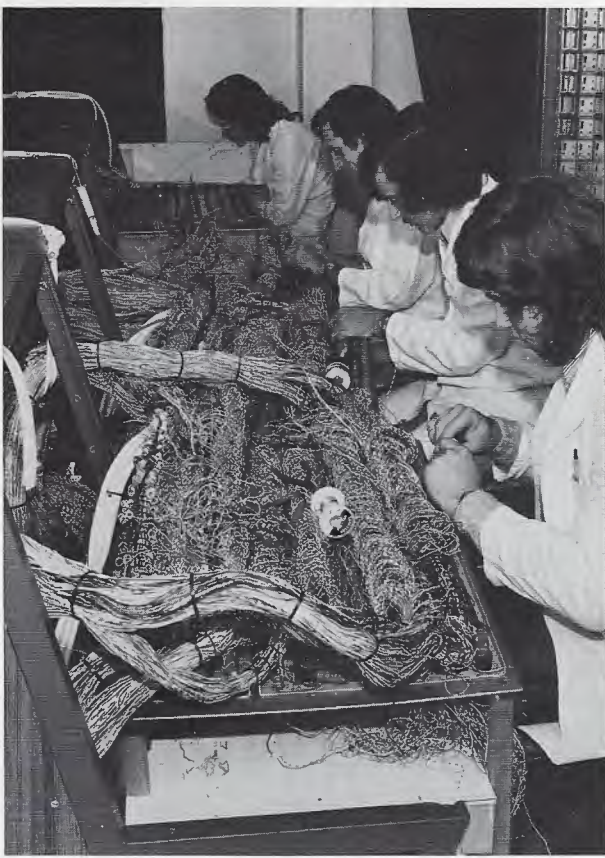
Installation of modern programmed switching centre.

Computerised AXE exchange under test in Sweden.

"memory" which took the number dialled all in one "gulp", instead of step-by-step. It then selected the best way to connect that number.

With Crossbar, Subscriber Trunk Dialling (STD) became a reality. A trunk call by STD was as easy to make and almost as fast to connect as a local call.

Today, twenty years later, Crossbar is being up-dated by the addition of equipment called ARE 11 to bring exchanges further into the era of modern electronic switching.

The next stage is that of totally computerised switching, such as the AXE system which is to be introduced into the Australian network in the next few years.

Epilogue

The telephone exchange has come a long way since its introduction to Australia in 1880. From "the Palace of Winged Words", operated by genteel young ladies in rustling Victorian skirts to today's buildings full of computerised and near-silent automatic switching equipment, whose nature would be almost incomprehensible to those first telephone girls.

But throughout all this development, the aim has been the same: to provide an efficient, speedy and convenient method of keeping people in touch wherever they may be.