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AUSTRALASIAN TELEGRAPHS.

By P. B. WALKER.

The Electric Telegraph having played such an important part in the development of commercial enterprise and local industry, the Author thought that a short sketch of the progress and development of the telegraphic operations in the Australasian Colonies would be interesting to the Members of the Engineering Association.

Some 48 years ago the Colony of Victoria was the first to lead the way in this important undertaking, on Australian soil the line from Melbourne to Williamstown being commenced on the 10th November, 1853, sixteen years after Cooke and Wheatstone transmitted those memorable first telegraphic signals between Euston Square, London, and Camden Town. The office at Williamstown was opened for the transaction of public business on the 3rd March, 1854, and the messages were sent free of charge until the 1st May, following, owing to the Victorian Electric Telegraph Act (17 Vict. No. 22) not having been passed by the Legislature at the time of the completion of the line.

It was natural that a work involving a considerable amount of expenditure and risk should be undertaken by the Government in a young country, and it fortunately proved successful at the outset, as a greater number of telegrams were sent in proportion to the population than are transmitted at the present time,—a notable fact, as, although the rates are

cheaper, the population has not increased sufficiently to bring up the average in transmission of messages to what it was in the early days of Telegraphy, though in comparison with England the proportion is two to one, and with America it is even greater. To show the importance of the Telegraphic Systems being under Government control an outline of the condition of the English Telegraph Service before the telegraphs were taken over by the Government in 1870 might not be out of place. The Postmaster-General of England says that, not only were the charges high, but the systems were very incomplete. It was in the nature of things that the Companies, whose aim was to secure a profit for the shareholders, restricted their operations to the principal towns. In the absence of an obligation to work the telegraphs as a national undertaking, they naturally refrained from extensions to the smaller towns and villages yielding unremunerative business. The result of these conditions was that the use of the telegraphs was confined to a comparatively small section of the population, such as Stockbrokers, Ship-brokers, Fishmongers, Fruit Merchants and racing men, and by maintaining high charges as long as they could, and reducing those charges inch by inch, and then only under pressure, by the confinement of their operations to important towns, and by planting their offices mainly in the business centres of the town, the Telegraph Companies had brought speculative men, and them only, to a free use of the telegraph. The transfer of the Telegraph business to the Postal Department brought about an immediate change in these conditions, as the charges were reduced, extensions of lines were made to places previously without telegraphic communication, and the wires were taken to the Suburbs of the larger towns and to the centres of the smaller towns previously served from the Railway,—with the result that, in a period of two years, as many as 2,200 additional Telegraph Offices were opened throughout the United Kingdom.” This shows clearly that the Governments

of the Colonies were justified in taking upon themselves the construction and maintenance of the Telegraphic systems, which have proved so beneficial to the whole of the Colonists, and the Legislature of Victoria recognised the benefit of this new means of communication when they, towards the end of 1854, sanctioned the further extension of the wires to Geelong, Queenscliff and Sandridge, a total distance of 72 miles. In November, 1855, Ballarat, Sandhurst and Castlemaine, as well as the other important towns throughout the Colony were connected by telegraph with the Metropolis of Victoria and now there are no less than 9,861 miles of wire laid in that Colony.

The establishment of the Electric Telegraph in Victoria set the neighbouring Colonies moving, and in 1856 South Australia entered the telegraphic field with a line from Adelaide to the Port, which was so successful that other extensions were immediately undertaken. The South Australian Parliament readily voted funds, and in the course of a few years extensions could be counted by hundreds of miles.

It soon became evident that Intercolonial communication between Victoria and South Australia was a matter of considerable importance to both Colonies, and in 1856 the work of connecting Melbourne and Adelaide was started, via Wilunga, Goolwa and Mount Gambier, a distance of 325 miles. This extension was completed, and the line opened, in March, 1858, a Vote of £20,500 having been provided for the purpose in February, 1857. The contract was let at £40 a mile, the Government undertaking to find wire, etc., and the estimated expense, excluding buildings, but including instruments, batteries and Station stores, amounted to £60 per mile. A portion of the line, some ten miles, had to be taken across the Goolwa Channel and Lake Alexandrina by a submarine cable which weighed 17 cwt to the nautical mile, the core consisting of seven copper wires, No. 18 gauge, forming one conductor, well insulated by thick gutta percha, the whole

protected by 18 strands of No. 16 gauge iron wire. The posts used were 22 feet long, as against 25 feet used in Victoria, the insulators well glazed earthenware, in place of white porcelain, which are now used, and the wire No. 6 gauge. The difficulties in constructing this line were not easily surmounted, as it traversed a country destitute of serviceable timber, land owing to this circumstance posts were very scarce, taxing considerably the energies of both Contractors and superintending officers who are deserving of praise for the successful manner in which they carried out the work of erecting the first extensive length of telegraphic communication in Australasia.

Early in July, 1856, the Colonial Secretary of Tasmania visited Victoria, and, seeing the new telegraphic arrangements, at once fortified himself with all the information requisite for starting the "New Electric Messenger" in his own Colony. On his return he called for and accepted tenders for the construction of a line from George Town to Mount Lewis. In September, 1856, correspondence was entered into with Victoria in regard to the establishment of telegraphic communication between the two Colonies of Tasmania and Victoria, which ended in a submarine cable being undertaken between Cape Otway and King's Island, the route followed being via Victoria Cove (King's Island), Sea Elephant Bay, North West Bight (Hunter's Island), and thence from Circular Head to George Town by cable. The submarine portion of the line was surveyed by the late Mr. S. W. McGowan, then General Superintendent of Telegraphs, and afterwards Deputy Postmaster General, in Victoria. The date for completing the line was fixed for the 14th May, 1859, and the cost £35,000, although at first it was thought it could not be done for less than £45,000. The cable suggested by Mr. McGowan was a single copper wire, the wire of No. 16 gauge, the cable not to weigh less than one ton to the nautical mile, and his estimate was £33,000. The distance over which it was contemplated to take the cable at first, viz., from

Hobart to Melbourne, was calculated at 682 miles, but after careful examination and reports from competent officers, the Otway-Gunn route was adopted and the cable satisfactorily laid. It subsequently transpired, however, that this route was not as good as at first anticipated, because the roughness of the sea at Cape Otway, King's Island, and Elephant Bay, as well as at other places along this route, caused so much friction that the cable was ultimately abandoned as useless, and a more suitable position was selected for the new cable to run from Cape Schank on the Victorian Coast to George Town Heads on the Tasmanian Coast, a distance of 150 nautical miles by cable. The cable was successfully laid by the Eastern Extension Australian and China Telegraph Company, in 1869, between these two places, and has been satisfactorily working ever since, being very largely used now although at first it was not considered a success. The local business has, too, been rapidly increasing, no less than 272,115 messages having been transmitted in 1895, with 151 telegraph Stations and 2,365 miles of wire in existence in Tasmania at the end of that year. Perhaps the most important line erected during the last few years in this colony is that completed in 1892 from Ouse to the West Coast, which has proved of great service, not only as a means of direct communication, but also as furnishing an alternative route for the West and North West Coast Stations when communication has been interrupted between that part of the Colony and Launceston.

Having placed herself in communication with South Australia by her Intercolonial line via Mount Gambier, as well as completed all matters with Tasmania for similar communication by cable with that Colony, the attention of Victoria, who was the leading spirit in matters telegraphic, was naturally turned towards Intercolonial intercourse by telegraph with New South Wales, who had so far been inactive in the matter of telegraphic communication. With this object, the lines were pushed through to Wodonga, on the border of the Murray,

near Albury, and that town was placed in telegraphic communication with Melbourne in December, 1857. In April of the previous year a correspondence had been entered into between Victoria and South Australia on the subject of Inter-colonial telegraphic communication generally, and the Superintendent of each Colony was directed to submit to his Government a full report, which resulted in Messrs. McGowan and Todd furnishing an exhaustive joint report in which they demonstrated the importance of, and advantages to be derived from, connecting New South Wales with the general system of telegraphy, and recommending that each Colony should erect the line within its own territory to a common point on its boundary, also that "an equal division of the receipts derived from all Intercolonial business should be adopted, and that the telegraphic code, regulations and other Departmental arrangements should be as nearly as possible identical."

New South Wales, then, was the last of the four Australian Colonies (Queensland not being then separated from New South Wales) to adopt the telegraphic system. The first steps were initiated by a letter from Capt. G. K. Mann, R.A., C.E., dated the 29th March, 1854, under instructions from the Colonial Secretary. He gave an estimate of the cost of ten miles of Electric Telegraph, which amounted to £2,027 odd, and was supposed to apply to a line to the Macquarie Lighthouse at South Head, or any locality within ten miles of Sydney. Following upon this the late Hon. Robert Towns on the 1st November, 1855, forwarded to the Colonial Secretary of the Colony a long report that he had obtained from Mr. S. W. McGowan, giving an estimate of 600 miles of line, which amounted to £55,000, as well as the probable yearly expenses which were then put down at £11,334. The daily revenue derivable from this large expenditure was computed at £65, or an annual total of 300 working days (excluding Sundays) of £19,500, which, less the proposed ex-

penditure for salaries, working expenses, etc. (£11,334), showed a probable profit of 8 per cent. per annum on the outlay. This communication was referred to the then Commissioner for Railways, Capt. G. K. Mann, who, in reply to the report, in the second paragraph of his letter says that "lines of overhead wires, if carried through the uncleared bush, would be constantly liable to interruption, not only from falling timber and bush fires, but also from theft, and, as recent improvements have been made in the Magnetic Telegraph Department of the Board of Trade, as to the most approved systems to be adopted, the Commissioners considered it best to delay communicating with the Telegraphic Companies until further instructed by His Excellency." The Commissioners then placed themselves in communication with His Excellency the Governor, who directed that inquiries should be made from persons in Melbourne in the matter. Thus it was that the older Colony had to seek the information necessary for commencing this important work from its offshoot. Nothing further transpired until the 12th August, 1856, when Mr. (now Sir Saul) Samuel G.C.M.G., addressed a letter to the Colonial Secretary of New South Wales in which he states "I have just returned from Victoria, where I have made myself acquainted with the construction of the Electric Telegraph. I have done this under the belief that the time has arrived when it must be apparent to all that the formation of Electric lines of communication ought no longer to be delayed if this Colony is to maintain its position with regard to the sister Colonies of Victoria, South Australia, and Tasmania. I will now point out to you the great political and commercial importance, if not necessity, of connecting the whole of these Colonies by one general line of telegraphic communication, a measure towards which such considerable progress has already been made in advance of New South Wales by the other Colonies. My object in writing is to inform you that I am prepared to undertake the formation of a line from Sydney

to Albury, to meet the line which in such a case, will be continued by the Government of Victoria to their frontier." This communication was simply acknowledged by the Colonial Secretary of New South Wales, but ultimately led to the appointment of a Select Committee on electric telegraphs of which the late Sir Henry (then Mr.) Parkes, G.C.M.G., was Chairman. In the report submitted by this Committee a recommendation was made that immediate steps should be taken in concert with the Government of Victoria to connect the Cities of Melbourne and Sydney by Electric Telegraph, and, further, that a sum not exceeding £38,000 should be placed on the Estimates for this purpose. This, then, was the starting point of telegraphic communication in New South Wales, the sum recommended by the Select Committee being duly voted, and Capt. B. H. Martindale, Royal Engineers, then Chief Commissioner for Railways, was placed in charge of the new Department as Under Secretary for Works and Superintendent of Telegraphs (in addition to his other position as Chief Commissioner for Railways), with whom was associated Mr. H. Macey Lay, the late Mr. E. C. Cracknell, and the author. Capt. Martindale at once set about the task of constructing the first lines in the Colony, and accepted tenders for the erection of lines to South Head and Liverpool towards the end of 1857, which were completed and opened for communication on the 26th January, 1858. On the 11th May, 1858, a further contract was entered into for the construction of a line from Liverpool to Albury, at £49 14s 6d per mile, but, the Contractor being unable to complete the contract, the Government had to obtain a fresh one at £57 per mile without instruments and buildings. This line was completed on the 26th October, 1858, which may be considered a Red Letter Day in the annals of telegraphic communication in the Colony, as it laid the foundation for all future operations on a very large scale, besides of course completing the circuit from Sydney to Adelaide. Since the completion of this connection, the

wires have been vigorously extended by the officers of the New South Wales Telegraph Department, and New South Wales can now boast of holding the premier position in Telegraphic and Telephonic matters, both in regard to length of line and receipts, there being upwards of 50,000 miles of wire including Railways and Telephones erected for the transaction of business, and the receipts amounting to £175,058 per annum. The posts used in the construction of the lines at this period were selected from box, iron bark or stringy bark timber, 23 feet long, 9ins. diameter at the base, and 7ins. at the top, but latterly these have been replaced by 28 feet poles. The offices were at first open from 9 a.m. to 6 p.m. daily, Sundays excepted, the South Head line, only, being available night and day for shipping purposes. The instruments used principally were "Morse's Recorders," and the batteries were similar to those used in Victoria (Chester's Main Batteries, composed of sulphuric acid and water), it being considered desirable to assimilate the arrangements as much as possible to those of the sister Colony, seeing that the two great Cities must ultimately be in constant communication, without the intervention of a Repeating Station at Albury, which it was at first necessary to establish on account of the numerous stations New South Wales was compelled to have on the main Circuit, but latterly a more modern type of Battery has been adopted, known as the Meidenger's Sulphate of Copper Battery, on account of its cheapness and durability. As further extensions were sanctioned, Parliament saw the benefits to be derived from telegraphic communication, and in order to facilitate the business between the two principal Cities a special wire was erected for direct Intercolonial traffic, so that the whole of the local business could be transacted on the old wire, and all impediments to rapid discourse were thus overcome. It should be mentioned that, prior to the opening of the line to Albury, the inhabitants of that town had in a most praiseworthy manner had a connecting wire erected be-

tween the two border towns, Wodonga and Albury, a distance of $2\frac{1}{2}$ miles, and by this means they were enabled to communicate direct with Melbourne some time previous to, the New South Wales portion of the line being completed. The charges at this time were necessarily high, especially when compared with the present generous rates. The charge between Sydney and Melbourne was 6/- for ten words and fourpence for each additional word; 9/- for ten words between Sydney and Adelaide, and 6d for each additional word. In 1885 the rate was reduced to 1/- for ten words between Sydney and Melbourne, and a penny for each additional word. Two shillings (2/-) for ten words and 2d for each additional word was charged when the direct line to Adelaide was completed, and the same rate is in force to Queensland, whilst 2/6 for ten words and 2d for each additional word is the charge to Tasmania, and 3/- for ten words and 5d for each additional word to West Australia, with, of course, special rates to all the Colonies for the Press.

In 1860, after separation from New South Wales, Queensland began to move in telegraphy, and the first line, between Brisbane and Ipswich, was opened on the 13th May, 1861, since which time that Colony has been pushing forward extensions rapidly in every direction, and the length of her lines is now only second to that of New South Wales, the total mileage at the end of 1895 being 17,790, and every district in Queensland of any importance now has complete telegraphic arrangements. It was not long of course before both Queensland and New South Wales saw the necessity of connecting the two Capitals, and a large business is now done, a copper wire being on the New South Wales side as far as Tenterfield, and the line worked by the Quadruplex system direct to Brisbane. Cables have been laid to most of the neighbouring Islands under the Queensland Government, one of the most important being that to Thursday Island, from Paterson, about 18 knots in length, which was laid in 1886 by the Eastern Extension

Company, and communication was established on the 25th August, 1887. By 1893 this cable had worn out, and was replaced by a new one along a more suitable route.

A still more important Cable is that between Bundaberg and Gomen, a distance of 792.5 miles, which, in addition to the business advantages to be derived from telegraphic communication with the French Colony, is very useful for meteorological purposes and enabling information to be furnished respecting escaped criminals leading to their capture; it will be remembered, too, that it was very largely availed of in connection with the wreck of H.M.S. "Ringarooma." Negotiations were entered into with the Societe Francaise des Telegraphes Sous Marine de Paris in 1891, and arrangements made for the laying of the wire, subject to a guarantee of £12,000 per annum over working expenses for 30 years, on the part of the French Government which guaranteed £8,000, and the Colonies of Queensland and New South Wales guaranteed £2,000 each. The line was completed on the 15th October, 1893, and it was originally suggested by the French Authorities that it should form the first stage of the proposed cable from Australia to Vancouver Island, although the proposal was never a popular one.

New Zealand made no telegraphic progress until the year 1864, when the Provincial Government erected a line from the Bluff to Invercargill, and other lines were in course of construction, with a Military Telegraph from Auckland to Drury, a distance of about 40 miles. Notwithstanding her late action, New Zealand has made such substantial progress that she holds one of the foremost positions amongst the Colonies as regards telegraphic matters, her length of line and receipts being considerably in excess of some of the other Colonies. There are two great features in connection with the New Zealand system which deserve special notice, as they are of importance to the whole of the Colonies, viz., the connection of the Northern and Southern Islands by cable via

Cook's Straits, and the cable from Cape Farewell on the New Zealand Coast to La Perouse (Botany Bay). It was long felt to be a drawback to the two Islands of New Zealand that they were unable to exchange Commercial and Political communications by telegraph between the principal Cities of Christchurch, Dunedin, Wellington, and other important places, and under the administration of Mr. John Hall, Commissioner for Telegraphs, this important link in the telegraphic circuits of New Zealand was completed at a total cost to the Colony of £29,864. The convenience afforded by this expenditure was of such utility that the Government deemed it necessary to lay a second cable, at a cost of £13,248, and under the management of Dr. Lemon the first system of duplex telegraphy in Australasia was worked on these Cables in 1874, for which he received special commendation from the New Zealand Government. The rapid progress under Sir Julius Vogel's administration led to the project of further extending the telegraphic belt from the shores of New Zealand to those of New South Wales, and through the energetic exertions of the then New Zealand Premier, Sir J. Vogel, and the late Sir John Robertson, Premier of New South Wales in 1885, an agreement was entered into by Sir Julius Vogel with the Telegraph Maintenance Company, in conjunction with the Eastern Extension Australian and China Tel. Company, to lay a cable from Cape Farewell N.Z., to La Perouse, Botany Bay. The work was commenced on the 12th February, 1876, and completed the same year at a cost of upwards of £300,000. New Zealand and New South Wales alone bore the onus of this cable, guaranteeing a subsidy of £7,500 per annum (New Zealand £5,000 and New South Wales £2,500) for ten years, the other Colonies standing out, as they did not consider it a fair charge on their funds. One of the Clauses in the agreement stipulated that the Company should not, during the continuance of the subsidy, charge more than 7/6 for a ten-word message and

10d for every additional word, with certain provisions for reductions. The charges were accordingly reduced (in fulfilment of an understanding arrived at in 1878, in connection with the duplication of the communication between Australia and Port Darwin) to 6/- for ten words and 7d for every additional word. In 1886 lengthened negotiations between New Zealand, New South Wales, and the Cable Company took place in regard to the continuance of the subsidy for a further period of five, or ten, years, on the understanding that the rates would be reduced to 5/- for ten words, Press messages 3d a word. The Company stipulated for ten years, but the New Zealand Government declined to go beyond five years, and, finally, although the Company was willing to accept the five years' arrangement, declined to give any subsidy at all, when the charges were raised by the Company to 10/- for ten words and 1/- for each additional word, the New Zealand Government retaliating by raising the land charges for the Island messages to 4/- for ten words, and using the amount thus obtained to make up the difference between the old and new rates payable to the Company. Subsequently, arrangements were made for removing the deadlock to allow matters to remain in statu quo ante until the New Zealand Government had an opportunity of reviewing the matter. In the following year the New Zealand Government decided not to renew the subsidy, the late Sir John Pender replying that the rates would be increased to 8/6 for ten words and 7d for each additional word. The charges have since been considerably reduced, the business increasing correspondingly, and it is now possible to send a message from New South Wales to New Zealand of ten words or under for 3/-, with a charge of 5d for every additional word.

West Australia, though last on the field of Australian Telegraphy, cannot be looked upon as the least important, having, especially during the last few years, largely extended her operations. The first line was opened between Albany and

Perth in 1872, but within a few years West Australia developed the system extensively, and by boldly making the important connection with South Australia through a very dry, barren, desert, country, overcoming what were considered almost insurmountable difficulties, conferred an everlasting benefit on the other Colonies. This line, which ran via Eucla, Port Lincoln and Port Augusta, occupied a long time in course of construction, and was only completed on the 8th December, 1877. It was certainly of great assistance to the general scheme of Australasian telegraphy, as it gave all the Colonies the means of obtaining speedy intelligence of the progress of the Mail Steamers along the Coast off Cape Leuwin. A duplicate line from Perth to Albany was completed on the 25th June, 1887. An important line, 500 miles in length, from Roebourne to Derby, was commenced in 1886 and completed in 1889, being taken over on the 9th April of that year. During the last few years the business has rapidly increased, especially that on the Perth to Eucla, Broome, Cue, Coolgardie and other mining lines, which exceed the most sanguine expectations; in fact, it was found necessary in 1894 to obtain Operators from the other Colonies to meet the increase in business, and this is still continued. The business between West Australia and the Eastern Colonies has also extensively increased, 232,086 messages being sent in 1895, with a value of £46,214.

Perhaps the greatest feature in our telegraphic operations is our communication with Europe. The bold action of the South Australian Government in erecting their overland line to Port Darwin through their Northern Territory was the first step towards the scheme. Many strong reports were written by the Heads of the Telegraphic Departments of all the Colonies in reference to opening up telegraphic communication with Europe through the Northern Territory, via India, but nothing worthy of notice was done until 1859 when Mr. N. Gisborne came out to the Colonies for the pur-