

pose of ascertaining what steps could be taken for opening up communication by way of Brisbane, Broadsound, and Java, and, after fruitless negotiations with New South Wales, Victoria and Queensland, he abandoned the projected work as also all other negotiations of a similar kind. The South Australian Government, on the recommendation of Sir C. Todd, K.C.M.G., undertook to build their overland line in 1870, and completely overthrew any negotiations of the Governments of the other Colonies by making an arrangement with Commander Noel Osborne, the representative of the British Australian Telegraph Company, to lay a cable from Singapore to Batavia, and a second one from the Eastern end of Java, via Timor, to Port Darwin, communication with Europe being opened up on the 22nd October, 1872. It was originally intended by the Cable Company that the cable should start from Normanton, and the Queensland Gulf line was constructed on that understanding, but Commander Osborne, on his way to Queensland, called at Adelaide, and was then induced to arrange for a connection with a line from that place. A lengthy correspondence between Victoria, Queensland, and New South Wales was carried on regarding an additional cable, upon which no definite arrangements could be arrived at, through Queensland insisting that the additional further cable should go by way of Singapore, but New South Wales and Victoria ultimately closed an agreement with the Eastern Extension and China Telegraph Company in 1878, for the construction of a second cable from Singapore to Port Darwin, guaranteed to last for 20 years, to be computed from the day the cable was laid and in proper working order, for an annual subsidy of £32,400, to be borne by the various Colonies upon a population basis. The Company agreed to the following scale of reduced charges:—

Government messages	2/10	per word
Press "	1/5	" "
Other "	5/8	" "

and in case the Company should agree to a subsequent reduction in the existing tariff ($5/8$ per word), it was agreed that not more than one-half such reduced rate should be charged for any Government message, nor more than one-fourth for any Press message; and any excess over and above the stipulated rates charged at the date of agreement by any telegraphic administration on behalf of the Company was to be allowed to the sender of any Government or Press message by way of discount. In 1891 it was agreed at the Conference held in Adelaide that the rates should be further reduced to

- 4/- for ordinary messages
- 2/6 for Government messages
- 1/10 for press messages

to be in operation for twelve months, but it subsequently transpired that the Company could not make this rate payable, as it was found that the reduced rate resulted in a loss of £55,000, and consequently at the Conference in Melbourne in 1892, it was agreed to alter the ordinary rate from 4/- to 4/9 per word, in order to reduce the loss to £18,000, which now leaves the cable rate on English messages at 4/9 per word, and 2d on the local rate making it 4/11. This alteration in the price has resulted satisfactorily to all the guaranteeing Colonies, as well as to the Company. Queensland refused to enter into the agreement, which was signed on the 6th May, 1879, and the remaining Colonies, New South Wales, Victoria, South Australia, and West Australia, became the contributing parties, on the following population basis:—

Colony.	Population, Sept., '81.	Amount.
New South Wales	751,468	£12,617 1 4
Victoria	862,346	£14,478 13 10
South Australia	286,211	£48,805 9 0
West Australia	29,708	£498 15 10
	1,929,733	£32,400 0 0

The New Zealand Government at first signified their intention of joining the other Colonies in making this arrangement, but this was subject to Parliamentary approval, which was withheld, with the result that the burden of the expenditure fell on the Colonies enumerated, but they ultimately entered the agreement in 1895, and now Queensland is likely to do so. The cable was laid by the Company in terms of their agreement in 1880; the total traffic for 1882 for South Australia amounted to £29,857 5s 7d, and the expenses to £30,915 16s 10d, showing a loss to South Australia on International business of £1,058 11s 3d for the year. The route taken by a message was through South Australia, via Adelaide and Port Darwin, to Banjoewangie and Singapore, thence to Penang, Madras, Bombay, Aden, Alexandria, and through the Mediterranean Sea to England.

To avert a recurrence of the interruptions to the cables between Port Darwin and Java, the Company erected a cable of about 890 knots in length from Banjoewangi to Roebuck Bay, West Australia, avoiding as far as possible the Volcanic region, it having been found that the break in the cables between Port Darwin and Banjoewangie was due to volcanic action. The completion of this line on the 22nd February, 1888, gave the Colonies the advantage of a third cable to Java, and an alternative land system, via Perth and Eucla, and also enabled the residents of West Australia to send their cablegrams direct, instead of via Adelaide as formerly, but unfortunately the anticipations as to avoiding interruptions were not fully realised, as breaks occurred during the following year, though matters have since so progressed and if a breakage does occur the fault can be placed and the defect remedied in a very short time, it has therefore been found of late years that the interruptions are very few and far between.

The business done by all the Australian Colonies by Cable with Europe during the year 1882 was as follows:—

Number of Messages.	Amount.
39,175	£225,567

and in 1895:—

1,948,639 words	£327,909
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So that it will be seen that the convenience of communication by cable has been fully appreciated by the Mercantile and other Classes of Australasia and Europe, this being brought about to a large extent by the reduced charges, although there is still room for improvement in this respect, but there is not much likelihood of any change until we have the long-talked-of Pacific Cable. A short sketch of the development of this question will be of especial interest.

Proposals were made in 1885 by a Syndicate, which subsequently was merged into the Pacific Telegraph Company, for laying a cable from Vancouver to a point on Australia or New Zealand, by way of Hawaii or Fiji. The proposals were based on an Imperial or Colonial guarantee of £100,000 a year for 25 years, subsequently reduced to £75,000—a condition being that the rates should not exceed 4/- a word. A counter proposal was made by the Eastern Extension Company, and both were discussed at a Conference called by Her Majesty's Government in April, 1886, to consider matters affecting the common interests of all portions of the Empire, when attention was drawn to the question of connecting Australasia and Asia with England by a Postal and Telegraphic route through Canada. The discussion, in which Mr. Fleming, whose name is so well known in the matter, took a prominent part, was carried on for some little time, and the more the question was considered the more deeply all those at the Conference became impressed with the vast significance of the issues which the new lines of communication involved for England herself, as well as the Australasian Colonies, India, Canada, and the whole outer Empire of Great Britain, and on the last day of the Conference the following resolutions were passed:—

(1). That the connection recently formed through the Atlantic to the Pacific, through Canada, by Railway and Telegraph, opens a new alternative line of communication over the High Seas and through British Possessions, which promises to be of great value alike in Naval, Military, Commercial, and Political aspects.

(2). That the connection of Canada with Australasia by direct submarine telegraph across the Pacific is a project of high importance to the Empire, and every doubt as to its practicability should without delay be set at rest by a thorough and exhaustive survey.

The scheme laid before the Conference, which had much in common with one propounded by Sir Julius Vogel, was to combine the several Telegraph systems of the Australian Colonies under one management, to include the submergence of a cable across the Pacific from Australia to Canada, and to provide for taking over at a valuation, whenever the Company might so desire, all the cables of the Eastern Extension Company.

An Australian Conference was held in Sydney in January, 1888, at which the proposals were discussed, and a resolution passed that it was desirable that a survey should be made of a suitable route, the cost to be borne by Great Britain, Canada, and the Australian Colonies, but that this was not to bind any of the Colonies to accept the proposals of the Pacific Cable Company.

The American U.S.S. *Tuscarora* took a series of soundings right through from Queensland to San Francisco, when out on a cruise to the Colonies and Islands some years ago, but these do not appear to be sufficiently extensive to satisfy the Admiralty as to the nature of the sea bed on the parts of the Pacific where the future Pacific Cable is destined to rest, and the Conference in London on the Pacific Cable question passed a resolution to have the route surveyed.

The H.M.S. "*Egeria*" made one or two sectional surveys

of the route, but the data obtained were insufficient for practical purposes, and in July following the Conference at Sydney, a despatch was received from the Secretary of State for the Colonies, dated the 1st May, 1888, transmitting a copy of a letter which Lord Knutsford had caused to be sent to the Lords Commissioners of the Admiralty, in which he says: "respecting the survey which Her Majesty's Government have "been requested to make of a route for a cable telegraph between Canada and Australia across the Pacific Ocean, together with an extract from their Lordship's reply," and stating that "Her Majesty's Government concur in the opinion "expressed in the letter from the Admiralty that the question "of accelerating the survey must remain in abeyance until "there is a prospect that the funds for the construction of the "Cable will be found." From an enclosure in this despatch it transpired that the annual cost of maintaining H.M.S. "Egeria" was about £12,000, and that if a similar vessel were provided specially for the purpose of making a complete survey of the best Ocean route and landing places, the cost would be about £36,000, irrespective of the value of the vessel and the cost of fitting her out.

At the Australasian Postal and Telegraphic Conference held in New Zealand in March, 1894, the question (which had been discussed at previous Conferences) was fully debated, and a resolution passed that "considering the importance of "the interests involved, both of a National and Commercial "character, in the establishment of a Pacific Cable, the representatives of the respective Colonies assembled at this Conference recommend to their Governments to consider the "desirability of entering into a guarantee with the other Countries interested, for a period not exceeding fourteen (14) "years, and to guarantee interest at 4 per cent. on a capital of "not more than £800,000 to any Company undertaking the "laying of a Pacific Cable; the tariff not to exceed 8/- a word "for ordinary telegrams, 2/- a word for Government tele-

“grams, and 1/6 a word for Press telegrams, to and from Great Britain and the Colonies, and that the United Kingdom be asked to join in the guarantee; the routes to be either of the following:—Brisbane to Ahipara Bay (N.Z.), Suva, Apia, Fanning Islands, Sandwich Islands, Vancouver, or New Zealand to Suva, Apia, Fanning Island, Sandwich Islands, Vancouver.”

The resolution at once created renewed public interest in the project, and assured favourable consideration at the Conference held at Ottawa, Canada, in June, 1894, and presided over by Lord Jersey, when it was resolved that immediate steps should be taken to provide telegraphic communication free from Foreign control between the Dominion of Canada and Australasia, and that the Imperial Government should be respectfully requested to “undertake at the earliest possible moment a thorough survey of the proposed Cable route between Canada and Australasia,” the expense to be borne in equal proportions by Great Britain, Canada, and the Australasian Colonies, and that it is in the interest of the Empire that in case of the construction of a Cable between Canada and Australasia such Cable should be extended from Australasia to the Cape of Good Hope. The proposal as to the proportion of the cost of survey to be borne by them was agreed to at the special Australasian Conference held at Sydney in January, 1896, when it was also resolved that in their opinion the Cable should be owned jointly by the various Governments interested, that landing places should be only on territory belonging to, or under the control of, the British Empire, and that the route from Fiji to Australia be via Norfolk Island, thence bifurcating to the nearest convenient landing places in the North of New Zealand and Moreton Bay respectively.

With the publication of the results of the Commission that sat in London on the subject at the end of 1896, when the Australian Colonies were represented by the Agents-

General of New South Wales and Victoria, the history of the question ends. It appears from a Cable message that the Commission is unanimously in favour of the laying of a State-owned Cable across the Pacific, by the route advocated at the Conference in Sydney, and recommend that Great Britain, Canada, and Australia should contribute, respectively, one-third of the cost. The majority of the Commission believe that the revenue prospects of the proposed Cable are favourable, and it is advised that a survey of the route be undertaken, and provision made for the ultimate duplication of the Cable. Professor Sylvanus Thompson, the authority on electrical science, states as a result of experiments that it will by new methods be possible, at a small extra cost, to despatch messages across this cable at a speed of 70 words per minute. It is to be hoped that, especially in view of the confidence expressed in the paying power of the line, that something definite will at last be done by the British Authorities in the matter, the Colonial Governments having frequently urged the matter, and that in a year or two the Pacific Cable will be an established fact.

That the establishment of telegraphic communication in the Colonies has been fully justified is proved by the steady increase in the business since its initiation (the number of messages transmitted in 1895 in all the Colonies amounting to 9,810,781), and the extension of the system into every place with any claims to recognition; indeed, it can be claimed that the telegraph has proved a most valuable factor in opening up and developing the interior. At the end of 1895 there were 90,763 miles of wire in existence throughout the Colonies, and this must necessarily have been greater but for the improvements that have been effected in telegraphy. The improvements that have been devised are very numerous, but the mention of a few of the more important will suffice to show the saving in time and expense that has been achieved. Where originally it was possible only to send one message

along a wire, now, by what is known as the Duplex System, two messages can be sent simultaneously along the wire, and four messages under the Quadruplex System, with six under the Multiplex System. On the Automatic and Duplex workings being introduced in England some sixteen years ago, they were found to be of such use that while the mileage of the wire increased by about 100 per cent. the messages increased in number as much as 230 per cent. In the Colonies the experience has been similar, and all the Colonies have been obliged to adopt these methods in order to avoid the necessity of duplicating and triplicating their lines to an uncomfortable extent, both in regard to the heavy expenditure in construction and the difficulty of finding it convenient to carry on the works in sufficient time to keep up with increasing traffic, because the reduced rates, as a natural consequence, were followed by an enormous influx of business.

New Zealand may claim to have first shown the Colonies the way to work the lines by means of the Duplex system, whilst New South Wales was the first to adopt the Automatic system, but as the latter system was more adapted for the transmission of lengthy Parliamentary speeches, and press reports than to the general business, it had to give way to the Duplex, and Quadruplex Systems. The Quadruplex was first adopted in the Colonies between Sydney and Melbourne, a No. 6 galvanized iron wire being first used as far as Albury, but this was found to offer so much resistance that a No. 4 iron wire was erected to Albury, and subsequently a No. 10 copper wire was, as well, substituted on the direct lines to Melbourne and Brisbane, as this gives the most satisfactory results. Victoria had the Duplex in operation in 1880; it was worked in 1882 between Melbourne and Adelaide, and the lines between Sandhurst and Ballarat were duplexed in September of the following year. Next year it was introduced in Hobart, and now every important line locally, as well as Intercolonially, is worked by either duplex or quadruplex, but it has not yet

been found necessary to introduce the multiplex system here, although it is probable it will shortly have to be called in to aid the distracted Electrician in appeasing the public hunger for news, and to satisfy the rapid march of modern progress to which electricity, in the form of telegraphy, has in no small measure contributed.

Besides these additions to science, the methods of detecting and remedying faults have also greatly improved, and the interruptions are now less frequent and continuous. Some of the causes of interruption are very curious. For instance, communication is at times interfered with through kites, birds, and even snakes becoming caught on the wires, poles being burnt and wire destroyed by bush fires, whilst, especially in Queensland, miles of wire are at times swept away by storms and floods. For example, in February, 1892, 108 miles of wire between Newcastle, Muswellbrook, and Scone were carried completely away. At Nevertire, too, during the recent storm, 15 miles of wire were interrupted, while the disastrous effects of the cyclone at Port Darwin, when not only miles of wire, but also the offices, were carried away, will be remembered by all. In the Northern parts of Australia, too, and in West Australia, the blacks used to cut the lines, but this evil is gradually subsiding. Great danger is at times incurred by those engaged in replacing the wires, and only last year, while repairing a line at the Don River, Queensland, which was in flood, one of the workmen employed was drowned.

The Telephone System has also made rapid strides. Introduced into New South Wales in 1882, it has gradually extended, until at the end of 1895 there were 4,096 telephones in use, showing on what a large scale operations are extending. Telephone Exchanges have been established in all the important Suburban districts, also at Broken Hill, Newcastle, Goulburn, Wagga Wagga, and West Maitland. In addition to their utility for Mercantile and Professional men, the telephones are of great use as a means of providing speedy com-

munication at smaller places where there is not sufficient justification for the telegraph, and the consequent appointment of a permanent official. So rapid has been the development of Telephony in this Colony under the reduced telephone charges, that from the 1st of May, 1896, to 31st December, 1,400 telephones were put in, and the Postmaster-General (Mr. Cook), looking at the demands for the future, and the over-crowded wires in the streets, directed the construction of tunnels for the purpose of relieving the traffic, and also obtained sanction of Parliament for a long-distance Telephone line to Newcastle to place that City in communication with the Metropolis. This work is now in course of completion, and will, no doubt, be the fore-runner of many other long-distance Telephone lines which will prove a great convenience to all classes of the community. In New Zealand, where the system was initiated before being adopted here, there were, in 1895, 5,042 telephones, yielding a revenue of £25,933 per annum. The Telephone System in Victoria was at first carried on by a private Company, but was taken over by the Government on the 22nd September, 1887, from the Victorian Telephone Exchange Company Limited, which was carrying on operations in Melbourne, Ballarat, and Sandhurst, and the business was continued by the Department without any interruption from the first, and in 1895 there were 9,887 miles of wire in existence and 2,609 subscribers. The telephone was first used in South Australia in September, 1880, when the Police Station in Adelaide was connected with the Fire Brigade and Valve House, but the system did not come into general use until the Telephone Act was passed in November, 1881, when the erection of a number of private and leased lines was commenced. The Adelaide Exchange was opened on the 14th May, 1883, with 48 subscribers, and the Port Adelaide Exchange on the 7th September, with 21 subscribers. Operations have since extended to such an extent that in 1895 there were 902 subscribers and 2,460 miles of wire in existence, yielding a revenue

of £13,755. In Queensland, too, the system is extending, although perhaps on not so large a scale, Exchanges having been established at Charters Towers, Townsville, and elsewhere, in addition to Brisbane, and the revenue derived from this source in 1895 was £4,976. As regards the other Colonies, West Australia had 373 subscribers in 1895, against only 63 in 1888, with a revenue of £3,853, while in Tasmania there were 627 lines, in all 520 miles, yielding £3,048 16s 3d rental. In this line, too, science has made wonderful strides, and the telephones of to-day are a great improvement on the old ones, and it is now possible to send a message which can be heard distinctly hundreds of miles away.

As showing the extent to which the telephone is now used in America, it may be mentioned that the great decline in the number of telegraph messages in 1894 is largely attributed to the fact that the telephone has been overlapped, or as they put it "persistently blanketed" the telegraph system, and while there was barely one telegraph message annually per head of the population, the number of telephone messages reached as many as eleven per head. In the same way in the Colonies, and more especially in New South Wales where the operations are larger than in the other Colonies, it is found that the telephones affect the telegraph business to a large extent.

In conclusion, the author remarked that the rapid strides which Telegraphy has made throughout the whole of the Australasian Colonies during the past 40 years, shows clearly that it is highly appreciated by the whole community.

At the same time there are few who understand the difficulties that the Telegraphist has to compete with, in carrying out what appears to the general public, the simple operation of sending a telegraphic message.

The great boon that Telegraphy has conferred in opening up and civilizing countries and extending its wonderful

powers to all parts of the world, has proved of the greatest benefit to humanity, bringing together towns, cities, countries, and nations, so that they may speak and converse through the public prints of the country upon every subject of importance, as well as in matters of minor moment, and it is impossible to say, looking at the progress that electricity has made during the last 50 years, what wonderful discoveries may be in store for the services of man in the next generation. For when we see what discoveries such distinguished men as Volta, Galvani, Morse, Faraday, Tindall, Huxley, Wheatstone, Siemens, Kelvin, Raleigh, Sylvanus, Thompson, Preece, Edison, Tessler, and numerous others have made in the past we cannot for a moment attempt to prognosticate anything in the undiscovered future of science.
