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the waves, to driftwood, to the grinding of ice in the more northerly latitudes, and to the danger of anchorage, especially of fishing boats, the sheathing must be very heavy. So that while the deep sea cable is somewhat less than an inch in diameter, that for the shore ends is nearly 2½ inches in diameter. The action of the waves is limited to a depth of only about 13 fathoms, so that their influence on the cable, manifested by wear and chafing, is confined to the shore end.

The Pacific Cable is equipped with the most modern apparatus at the various stations, and the cable is worked duplex, that is, messages are sent and received on the same cable at the same time.

Canada had carried longitude work from Greenwich across the Atlantic and thence to Vancouver. The completion of the British Pacific Cable offered an opportunity for continuing the work across the Pacific in the interests of navigation and geography, besides tying for the first time longitudes brought eastward from Greenwich with those brought westward, making the first longitude girdle round the world.

In October, 1902, the Honourable Mr. Clifford Sifton, Minister of the Interior, authorized the carrying out of the Transpacific longitudes, and the Governors of the South Sea, Australia and New Zealand were respectively officially notified thereof.

In preparing the programme for carrying out the work, the climatic conditions of the various stations to be occupied were studied so that the most favourable times and seasons might be chosen. It was found that Suva, Fiji, was the governing factor, as it was by far the rainiest place of the series.

Besides the transit outfit, I carried, too, a half-seconds pendulum apparatus, and a Tesdorpf magnetic instrument, the latter similar to the ones furnished to Drygalski of the *Gauss* on his Antarctic expedition.

ITINERARY.

Mr. Werry left Ottawa on February 27, 1903, and proceeded to San Francisco, whence he sailed for Samoa, where he took the northbound steamer for Fanning island. The southbound steamers in passing Fanning do not call there. In the latter part of March, Mr. McDiarmid and I proceeded to Bamfield, Vancouver island, the eastern terminus of the Pacific Cable. After installing the sidereal clock and its connection with the cable, I returned to the Vancouver observatory to begin observations. Bamfield, where no observations were taken, was simply used as a clock exchange station for making comparison between the Fanning and Vancouver clocks.

By the end of April a satisfactory number of observations had been obtained at Fanning and at Vancouver, and the first link of the Transpacific longitudes completed.

I took passage on the Canadian-Australian steamer *Miwera*, and sailed on May 2 for Suva, Fiji. We called en route at Honolulu. Here were met the two American astronomers, Mr. Edwin Smith and Mr. Fremont Morse, who were engaged in the determination of the difference of longitude, San Francisco-Honolulu. Suva was reached May 20, and immediate steps were taken for the erection of the pier and the observatory. The Fanning-Suva longitude was completed on June 21. It may be stated that as Suva is just west of the 180th meridian, and Fanning east of it, the dates for the observations of the same night differ by a day. Mr. Werry left Fanning on June 27 for Norfolk island some 3,000 miles distant. This necessitated a rather circuitous route of about 7,000 miles for lack of suitable steamer connections. He had to return to Honolulu thence to Samoa, Auckland, New Zealand, Sydney, Australia, and finally to his destination, which he reached in the beginning of August, occupying about six weeks to reach the cable station at Norfolk island. During this interval I made pendulum and magnetic observations at Suva, and also paid a visit on invitation of Roko Kandavu, grandson of the great cannibal king, Cakobau, the present ruler, at the old Fijian capital on the small island of Bau, some 20 miles from Suva.