

by Borass, the value 980.112 cm. per sec., per sec., was adopted for the New Jersey Avenue Base. Observations at Washington by Meinesz and Miller, in 1928 and 1929, suggested that this value was a few milligals too low. Due to its importance as a reference point and in order to remove doubt, the Coast and Geodetic Survey made a direct connection between Washington and Potsdam by Lieutenant Edwin J. Brown of the staff of the Survey in 1932 and 1933. By this time the New Jersey Avenue Base had been destroyed by building operations. It had, however, been connected in 1893 with the first gravity base station in Washington in the Smithsonian Institution. In April and May, 1932, a connection was made between the Smithsonian base and the new base station established in the new Department of Commerce building on Constitution Avenue, Washington, D.C. Brown adopted 980.118 cm. per sec., per sec., for the new commerce base the mean of his own observations and those of Miller's reduced to the new base. The two sets by the separate observers, agreed within one-tenth of a milligal for the bronze pendulums employed by both observers. The invar pendulums used only by Brown, gave a discordant result differing by 3 milligals.

Although it is not made expressly clear in Brown's report, it appears that the adopted value 980.118 cm. per sec., per sec., for the new Commerce base, implies 980.117 cm. per sec., per sec., for the New Jersey Avenue base at which observations have been made by the Dominion Observatory, Ottawa.

During 1928 and 1929, a careful comparison was made by the Dominion Observatory between Ottawa, Greenwich, Potsdam and the New Jersey Avenue base in Washington. Three pendulums and two knife edges were used. Assuming the value for Potsdam, six individual values were obtained for each of the other places. The average departure of the mean from the six individual values for Greenwich was 1 milligal, for Washington, 1 milligal and for Ottawa, 2 milligals. The value 980.622 cm. per sec., per sec., has been adopted for Ottawa, with reference to Potsdam. The most probable absolute value for Ottawa is 980.605 cm. per sec., per sec.

Forty-two stations were established across Canada between Halifax, N.S., and Vancouver, B.C., with the pendulum apparatus in 1914 and 1915. Since then, the number of pendulum stations observed in Canada has increased to a total of 186. Most of them are in the southern part of the country but 10 stations have been observed in the Northwest Territories north of 60° . The most northerly station, at present, is Cambridge Bay latitude $69^\circ 07.4$ N. and longitude $105^\circ 04.1$ W. A combined airborne gravity and magnetic expedition established seven stations, including that at Cambridge Bay in the Northwest Territories, in 1945.

The results of these gravity observations are of value as reference points to commercial concerns engaged in exploration by the gravity method. They are of great value in determining the shape of the earth and the form of the geoid or level surface of the earth. The results of the observations have been used to investigate the nature of the earth's outer and lighter crust in Canada. These studies suggest that the crust varies in thickness from 35 kilometres along the coasts and less elevated regions to about 50 kilometres or more in the mountains of British Columbia. The crust rests upon a lower and denser layer in a condition of isostatic equilibrium somewhat akin to that of an iceberg in the sea, except that the lower layer is not fluid like water, but yields to long continued stress. It is apparent though, that the layer beneath the outer crust possesses some strength even over long periods of