Prediction of Earthquakes.

The prediction of earthquakes has recently met with a certain amount of success in Japan, where the seismologists have proved their ability to predict destructive shocks in areas where a detailed study of conditions has been made. The subject is being investigated by the Carnegie Institute of Washington, and by other agencies with a view to the prediction of earthquakes. The fundamental principle involved in the study is that earthquakes are due to an abrupt adjustment of the accumulated strains in the crust of the earth, and that the strains as they accumulate cause a gradual distortion of the earth's surface which can be measured by geodetic methods. The detection of the movements of the surface require, as a preliminary step, a detailed precise triangulation and levels in regions of seismic activity.

The mean annual values of the magnetic elements as far as they are available are given in Table C following:—

Table C.—Mean Annual Values of the Magnetic Elements at Christchurch Observatory.

Date.	Declination E. of N.	Annual Change.	Horizontal Force.	Annual Change.	Vertical Force.	Annual Change.	Inclination South.	Annual Change.	Published in Annual Report.
	° ′	′	C.G.S. Unit.	γ	C.G.S. Unit.	γ	° ′	′	
1902 ..	16 15·1	+3·2	0·22694	−25	0·55277	+ 9	67 40·8	+1·50	1912–13
1903 ..	16 18·3	+3·5	0·22669	−25	0·55286	+21	67 42·3	+1·80	1912–13
1904 ..	16 21·8	+3·6	0·22644	−16	0·55307	+41	67 44·1	+1·70	1912–13
1905 ..	16 25·4	+2·4	0·22628	−23	0·55348	+28	67 45·8	+1·80	1919–20
1906 ..	..	..	..	..	..	..	..	..	..
1907 ..	16 31·1	..	..	..	..	..	..	..	..
1908 ..	..	..	..	..	..	..	..	..	..
1909 ..	..	..	..	..	..	..	..	..	..
1910 ..	16 37·6	+1·4	0·22515	−27	0·55485	+12	67 54·8	+1·40	1920–21
1911 ..	16 39·0	+2·5	0·22494	−23	0·55497	− 9	67 56·2	+1·00	..
1912 ..	..	..	..	..	..	..	..	..	..
1913 ..	16 44·0	+0·8	0·22449	−35	0·55478	−13	67 58·2	+1·60	1913–14
1914 ..	16 44·8	+2·2	0·22414	−27	0·55465	+ 7	67 59·8	+1·67	1914–15
1915 ..	16 47·0	+2·8	0·22387	−32	..	..	..	..	*Sept., 1918
1916 ..	16 49·8	+3·2	0·22355	−27	..	..	..	..	*Sept., 1918
1917 ..	16 53·0	+2·7	0·22328	−24	0·55486	+30	68 04·8	+1·90	*Mar., 1921
1918 ..	16 55·7	+2·9	0·22304	−24	0·55516	− 9	68 06·7	+1·10	1918–19
1919 ..	16 58·6	+3·1	0·22280	−19	0·55507	+18	68 07·8	+1·40	1919–20
1920 ..	17 01·7	+2·9	0·22261	−20	0·55525	+03	68 09·2	+1·10	1920–21
1921 ..	17 04·5	..	0·22241	..	0·55528	..	68 10·3	..	1921–22

* Published in *New Zealand Journal of Science and Technology*.

Proposed Operations for the Year 1922–23.

Triangulation.—Signals will be erected and precise observations will be made of the angles of the triangles comprised in a scheme extending from the Kaingaroa Plains base-line to the coast in the north and east directions. The immediate object of this survey is to control the extensive settlement surveys in progress in the Urewera country.

Standard Surveys.—Mr. C. A. Mountfort, District Surveyor, will complete the plans of the surveys of Palmerston North and the rural standard traverses in the vicinity of Feilding. The standard survey of Gisborne will be continued by Mr. H. M. Kensington, District Surveyor.

Rural standard traverses will be continued by Mr. F. H. Waters in the neighbourhood of Christchurch, and the long-deferred survey of the Clutha district, in Otago, will be undertaken by Mr. S. T. Burton, District Surveyor. These surveys will be proceeded with during periods of slackness in the settlement work.

Settlement Surveys.—The work may be summarized as follows: 484,930 acres rural survey; 172,508 acres Native-land survey; 206 miles road survey; 103 acres town survey. Apart from the above-mentioned work, there is the customary inspection of surveys by the Chief Draughtsmen and staff surveyors, the work of computing tide-tables, measuring the curves of the magnetic elements, the preparation of geodetic tables, and the drawing and compilation of the maps for publication. The details of the field-work is shown in Table IV.

Topographical Survey.—It is proposed to start this work as soon as the services of a surveyor are available. To meet the wishes of the Defence Department the survey will be commenced near Auckland, and as the maps will assist in the research work being conducted by the Cawthron Institute in connection with their soil survey and experiments in afforestation, a second party will commence operations in the Nelson District at an early date.

Publications.—A second edition of Professional Paper No. 3, "The use of the Barometer for the Determination of Heights," is now in the press. The subject-matter has been revised, brought up to date, and a number of new tables have been computed. These departmental publications are more than self-supporting, and are in demand from all parts of the world.

General.

Proclamation of Roads, &c.—A number of applications for the proclamation of road-lines laid off by the Native Land Court pursuant to sections 48, 49, 50, and 52 of the Native Land Amendment Act, 1913, were dealt with during the year under review. The statutory notices were duly served on the local authority of the district in terms of section 15 of the Native Land Amendment Act, 1914, and in the large majority of cases no objections were raised to the proclamation of the roads.