

The Benschdorf electrograph has been kept in operation continuously, and the records have been measured and hourly values tabulated for all days with satisfactory records. Internal dewing still gives a lot of trouble, and can only be satisfactorily cured by the provision of an all-enclosed electric heater, using alternating current supplied by (preferably) an underground cable from the existing power-main running past at some chains away from the electrograph-house. The spider nuisance has been much reduced by providing a metal cowl over the base of the projecting collector arm. The ebonite insulator on the torsion head is at intervals a source of weakness, although it is tested daily, and other insulation is maintained satisfactorily. Some further culling of values is being done to the electrograph records just now before they are published. The results for 1928-29 have been published in the *Journal of Terrestrial Magnetism*, September, 1930, and were found to confirm the peculiarity of phase-angles of the atmospheric electric potential component variation found in other parts of the world. The diurnal pulse is evidently world-wide simultaneous in its action, and must be further investigated. The next point of interest is the character of the annual variation in this latitude; and in this connection undisturbed measures of air conductivity and ionization will be of value.

The usual thrice-daily meteorological observations have been continued and the resulting information made available to the daily papers. Government Departments and other organizations have been supplied with various detailed information from our past tabulated meteorological records, which are proving increasingly useful.

Commencing early in January, Mr. Baird carried out a small magnetic survey near the Moturoa Oil-well. The elements observed were dip and vertical force. On the completion of this work the opportunity was taken to reobserve the magnetic dip at the old stations A and B, New Plymouth.

At Western Park it was found that excavation and levelling of the ground had removed the old magnetic station; however from the horizontal co-ordinates the position was fixed by Mr. C. Kenny, a surveyor from the District Office, New Plymouth. A totara peg was put in, and this station was observed at on the 3rd February, 1930. The observed dip (circle 147, needles 1 and 2) was found to be $-64^{\circ} 08' 4$ at 10.35 N.Z.S.T. At New Plymouth Racecourse the site of the old magnetic station had evidently been excavated some 6 ft. This station was also refixed by horizontal co-ordinates by Mr. Kenny, and the dip was observed on the 3rd February, 1930. The resulting dip (circle 147, needles 1 and 2) was $-64^{\circ} 36' 38$ at 15.00 N.Z.S.T. In 1903.5, the epoch of the magnetic survey, the dip at Stations B and A, New Plymouth, were $-63^{\circ} 29' 7$ and $-63^{\circ} 56' 1$ respectively; hence in 26.75 years the dip has increased $-38' 7$ and $-40' 3$ at these stations; the average annual rate is $-1' 47$ (angle of dip increasing). At the Christchurch Magnetic Observatory over these years the average rate of change of dip has been $-1' 33$ per annum.

TIDAL SURVEY.

The tide-tables for the year 1932 for the seven New Zealand standard ports (Auckland, New Plymouth, Wellington, Lyttelton, Dunedin, Bluff, and Westport) for which tidal predictions are published were received in Wellington on the 13th June, 1930, from the Hydrographer to the Admiralty.

The work of measuring the times and heights of high and low water was again performed at the Tidal Institute, University of Liverpool, England.

The investigations carried out to determine any vertical movement in the Earth's crust at Westport as a result of the disastrous earthquake which occurred in June, 1929, show that no appreciable movement has taken place. The deviations from the derived value of mean sea-level for five years (1918 to 1922) are as follows: For period one year prior to earthquake, $+0.139$ ft.; one year subsequent, $+0.084$ ft. As Westport is a riverain port, these differences cannot be taken as definitely indicating any change.

Mean high water and mean sea-level has been determined for Hokianga from automatic tide-gauge records, as follows: Mean high water, 14.65 ft. above zero of standard gauge; mean sea-level 10.50 ft. above zero of standard gauge. Concrete block centred with iron pipe 20.79 ft. above zero of standard gauge, therefore mean high water equals 6.14 ft. below concrete block.

PROPOSED OPERATIONS, 1931-32.

On the 3rd February, 1931, the Hawke's Bay District suffered considerable damage as a result of a disastrous earthquake, followed by fire, in which the departmental records were destroyed. With the exception of a certain amount of survey data which is being collected from private surveyors, and all other available sources, practically the whole of the survey records in this district have been destroyed.

For the purposes of re-establishment, and as a basis for future surveys, it is proposed to revise the present triangulation in the district, as well as the standard surveys of Napier and Hastings; also to run a series of rural standard traverses along the main roads.

Geodetic Triangulation.—Owing to the loss of the Hawke's Bay records, it will be necessary to undertake the revision of the triangulation in that district, and the field-work of the geodetic triangulation will, unfortunately, have to cease temporarily and the surveyor proceed to the more urgent work in Hawke's Bay. The connection to the Matamata base will, however, be completed before the temporary cessation, so that, of the five bases in the North Island, four of them will be interconnected.

Minor Triangulation.—The only work proposed to be done of this class is the reobservation of the Hawke's Bay circuit, the records of which have been destroyed.

Precise Levelling.—Instrumental equipment for this work is now available, but while it is very desirable that this work should be commenced, especially in the Hawke's Bay District, where an unknown area has been uplifted, it is not proposed to proceed with the work during the present year, for financial reasons.