

APIA OBSERVATORY, SAMOA.

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The same programme of work in geophysical subjects was followed during the year 1935–36 as in the past, the principal subjects of study being terrestrial magnetism, seismology, meteorology, and atmospheric electricity.

TERRESTRIAL MAGNETISM.

The study of terrestrial magnetism in Samoa comprises absolute measurements of declination, dip and horizontal intensity, and continuous recording of the variations in declination, horizontal intensity and vertical intensity by means of autographic instruments. The instruments used are a Tesdorpf magnetometer (No. 2025) and a Schulze earth inductor, a self-recording Godhavn balance, and two self-recording Eschenhagen variometers; but early in 1936 the Tesdorpf magnetometer was sent away to Germany for repairs and standardization, and its place was taken meanwhile by magnetometer, C.I.W. No. 9, which the Observatory holds on loan from the Department of Terrestrial Magnetism in Washington. Experiments for intercomparison between the two magnetometers were made during the last three months of 1935. The results show that the Tesdorpf magnetometer required the following corrections to be applied to it to reduce its results to the international magnetic standard:—

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|------------------|----|----|----|----|----|---------------------------|
| Declination | .. | .. | .. | .. | .. | Minus 2.5 minutes of arc. |
| Horizontal force | .. | .. | .. | .. | .. | Minus 0.00063H. |

A discontinuity arose in April, 1935, in the base-line value of the variometer for declination, which has been traced to a defect in collimation in magnet 13.

In tabulating the hourly values of the magnetic elements the ordinates of the graphs drawn by the variometers have been measured in millimetres, and the final results obtained after converting to magnetic units have been presented as departures from the mean of the day.

SEISMOLOGY.

The instruments in use for seismological work are the 1,000 kilogram astatic pendulum and the 80 kilogram vertical seismograph of Wiechert. The number of earthquake shocks recorded during the year ending on 31st March, 1936, is 279. Nine of them were slight local shocks which ranged in intensity between 2 and 5 on the Rossi-Forel scale, and there is also a record of the disastrous earthquake of 30th May, 1935, at Quetta. The vertical seismograph is unsatisfactory, and is only used to obtain the first movements in near earthquakes of moderate intensity.

ATMOSPHERIC ELECTRICITY.

Records of the gradient of potential in the air were obtained from a Benndorf self-recording electrometer. The reduction factor of the electrometer was determined on 31st May and again on 13th September by means of absolute observations on the sand-flats to the south of the Observatory. Spiders, which are a constant source of trouble, interrupted the records of the electrometer from time to time.

A certain amount of time was devoted to the Gerdien and Ebert apparatus for measuring the conductivity of the air and the number of ions. The results were disappointing, and it was decided that the instruments themselves are too old to give satisfactory service.

The upper insulator of Wulf electrometer, C.I.W. No. 30, had to be replaced by a new one. The old insulator had completely lost its insulating properties, having become opaque and filled with tiny cracks.

The monthly mean values of atmospheric potential gradient during 1935 at Apia are as follows, expressed in volts per metre: January, 100; February, 94; March, 111; April, 100; May, 99; June, 115; July, 126; August, 140; September, 117; October, 107; November, 106; December, 116: mean for the year, 111 volts per metre.

Mr. H. B. Sapsford completed in November, 1935, a paper on maxima of potential gradient at Apia, for insertion in the *Journal of Terrestrial Magnetism*.

METEOROLOGY.

The work in meteorology at Apia during the year 1935–36 consisted of surface observations twice a day and some measurements of the upper winds from time to time, using pilot balloons. The times of the daily observations are 9 a.m. and 3 p.m. zone time, 165 degrees west meridian. The method used with pilot balloons has been normally the method of the single theodolite. During the week 16th to 21st March, 1936, ascents have been made at 7 h. G.M.T. in conjunction with the International Meteorological Organization. The balloons had to be observed on this occasion by means of small lanterns carried by them, because the adopted time of observation is after nightfall in Samoa. The total number of pilot balloon ascents during the year under review is 90.

The Observatory continued to receive reports of rainfall from about twenty local stations in the Samoa Islands, and to issue these reports to the *Samoa Herald* for publication. In addition the Observatory supplied this newspaper with predicted tide-tables and the phases and times of rise and set of the moon.

The Observatory also continued to prepare synoptic charts of the weather in the South Pacific, using the weather reports received every day by the radio station. The area covered by these reports