

The forecasts and storm warnings for December were issued by Forecast Official H. V. Payne.

TORONTO OBSERVATORY.

MAGNETIC REPORT FOR DECEMBER, 1897.

Mean westerly declination..... $4^{\circ}54'0$

Mean horizontal force..... 0.16640

This month the magnets were more disturbed than for many months past; disturbances on the morning of the 11th and night of the 20th, were very pronounced, especially the former, where a range of $1^{\circ}4'$ in a short time was registered.

Declination.—The magnet was slightly disturbed on the early hours of the 1st and again from 22^h until 6^h of the 2nd. On the 4th, at 3^h 12^m a small abnormal westerly movement of the needle was shown at 3^h 28^m; it was considerably accelerated and after reaching its maximum the needle gradually returned to normal position. Between 20^h of the 4th and 6^h of the 5th and again at a corresponding time the following day the magnet was decidedly disturbed, but no large deviations occurred. After this there was a comparatively quiet period until 12^h 26^m of the 9th, when a quick westerly deflection set in and was followed by a gradual return to the normal reading. On the morning of the 10th, small changes were going on but passed off about 10^h and appeared again at 20^h when a disturbed period began. At 23^h 28^m of the 10th, the movements increased, a westerly deviation then taking place followed by irregular movements with the needle somewhat west of its mean position. By 4^h a well marked storm had developed. The westerly extreme occurred at 5^h 40^m and the easterly at 5^h 56^m, the total range was $1^{\circ}4'$. Shortly after 6^h the disturbance commenced to abate but perturbations prevailed all morning, in fact up to 14^h. During the night signs of disturbance again appeared and the needle continued slightly disturbed all morning of the 12th. Abnormal movements were recorded on the early hours of the 15th, and a sharp westerly hitch at 20^h followed by a more prolonged easterly movement, was well marked. A slight disturbance then continued until the morning of the 16th. The 17th was slightly disturbed, especially during the afternoon. Occasional movements were noticed on the 18th, also between 22^h and 24^h the following night. On the morning and night of the 20th a marked disturbance was shown. The movements during the night being the more rapid. From 7^h 20^m to 12^h the needle was west of its mean position. Very rapid swings were noted after 20^h and at 21^h 41^m a westerly swing of $41'$ was recorded, the maximum taking place at 21^h 48^m the reading being then $33'6$ west of the monthly mean. The minimum reading occurred at 20^h 55^m being $19'3$ east of the mean. At 23^h the needle was quieter, but a disturbed magnet prevailed up to 6^h of the 22nd when the trace failed owing to an accident to the driving clock. The afternoon and night of the 22nd was somewhat disturbed, in fact up to the 25th. On the morning of the 28th irregular movements were again noticed and continued to the end of the month.

Horizontal Force.—The first marked change was a remarkably sudden decrease at 12^h 26^m of the 9th, lasting a short time. The change was not very large, but appears very striking, as the trace was smooth previous to this change; it was followed by a gradual recovery. On the 11th, during the early morning the force was changing rapidly and was generally below its normal value. At 5^h 28^m a series of rapidly decreasing swings set in and by 5^h 44^m it had decreased 00350 C. G. S., it then quickly recovered, the needle moving in sharp swings. A second minimum was noted at 6^h 41^m, a recovery swing then began and the needle became much quieter. The total range of H. F. was 00504 C. G. S., slight changes were going on during the early hours of the 15th, also on the afternoon and night. And after 6^h of the 20th a decided but gradual decrease of this component set in the needle giving a minimum reading a little later than 10^h, after which a steady recovery began. All afternoon the force was changing slightly and between 20^h and 22^h 20^m some rapid little swings were noticed. After 22^h 20^m the disturbance became less active but a disturbed period prevailed up to the morning of the 24th, when the curves became more uniform. On the morning of the 29th slight changes again began and were noticeable to the end of the month.

Aurora.—There were no auroras observed during the month. On the 1st, 16th, 17th, 22nd 23rd, 24th and 27th, the sky was clear but no aurora was observed, on all other nights clouds or haze would have hidden any aurora which might have existed.

R. F. STUPART,

Director.

MAGNETIC OBSERVATORY,

TORONTO, 27th January, 1898.