indeed seem to be the most plausible phenomena capable of giving rise to disturbances on fixed dates scattered irregularly through the calendar. Meteoric dust particles with diameters of from one to four microns are considered to be those most likely to provide rain-forming nuclei. Unlike the larger particles which, as visible meteors, burn up in the atmosphere practically without decelerating, the meteoric dust should be brought to rest at a height of about 100 kilometres irrespective of speed and direction of approach, and should then take about a month to sink to tropospheric levels. This agrees well with what is found on comparing the dates of principal meteor showers with the dates of rainfall peaks. There appears to be an interval of 29 or 30 days between them. The showers associated with the January peaks are the Geminids (December 13—14), the Ursids (December 22) and the Quadrantids (January 3).

This connection between meteors and rain, if substantiated, will have important repercussions in rain physics and artificial control of weather, and the progress of the investigation is being followed with great interest.

Reference

(1) Bowen, E. G., "The influence of meteoritic dust on rainfall", *Aust. J. Phys.*, Vol. 6, No. 4 (December 1953).

Observations of the old Meridian Mark at Chingford

by

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A special series of observations of the old meridian mark at Chingford has recently been made with the Airy Transit Circle at Greenwich. The observations were spread over two periods, the first from mid-June to mid-August and the second from mid-September to mid-October.

The mark on Pole Hill, some eleven miles north of Greenwich, was erected in 1824 under the direction of John Pond, Astronomer Royal at the time, and was used by him to check the azimuth of his transit instrument. It takes the form of a tall granite obelisk surmounted by a diamond shaped pointed iron spear which, in those days, was seen silhouetted against the sky. With the growth of the trees of Epping Forest immediately behind the mark it very soon became invisible from Greenwich and observations were abandoned in 1836. It was never observed with the Airy Transit Circle. A photograph and description of the mark by Mr. W. M. Witchell appeared in *The Observatory*, **57**, 1934 September. The mark was situated approximately on the meridian of Pond's transit instrument, which was the first meridian used by the trigonometrical survey of Great Britain. It is approximately 19 feet west of the present Greenwich meridian (zero of longitude).

In view of the impending transfer of the meridian work of the Royal Observatory to a new site at Herstmonceux and the termination of observations with the Airy Transit Circle, it was realized that this was the final opportunity of checking the azimuth of the mark with the accuracy

possible with such a large "theodolite". At the same time it was hoped that an accurate determination of the azimuth of the mark from the transit circle in conjunction with a triangulation from Greenwich to Herstmonceux, and a determination of the deflection of the vertical at the two stations from a survey of gravity anomalies, would lead to an independent determination of the astronomical latitude and longitude of the new site at Herstmonceux.

An examination of the pre-war visibility observations showed that a light placed on the mark should be visible at Greenwich in the summer months for 70 or 80 per cent of the time. The Ordnance Survey were approached and willingly offered to co-operate to the extent of stationing a light keeper at Chingford to maintain such a beacon.

The programme of observation consisted of the measurement of transits of circumpolar stars at both upper and lower culmination, with a special series of measures of the level and collimation errors of the telescope and simultaneous observation of the Chingford light.

During the first period of observations it was found that the light could usually be seen at Greenwich at all hours of the day and night, in spite of the London smoke. In fact the difficulty was to secure sufficient "doubled" azimuth star observations since the shortness of the summer nights entailed the observation of the majority of the transits in daylight, always a difficulty. During the second period of observations in the autumn, it was possible to "double" azimuth stars with both culminations in darkness, but the visibility of the lamp suffered considerably from the mists which are common at that season.

In spite of these difficulties, a considerable mass of information has been accumulated.

To secure the numerous observations of the azimuth stars with the twelve-hour interval between the successive transits has necessitated very long watches at the telescope, and the enthusiastic co-operation of the transit circle observers is gratefully acknowledged; so too is that of the Light Keeper at Chingford.

The reduction of the observations is now in progress. It is early to say with what precision the azimuth of the mark will be determined, but it is hoped that its probable error will be not more than a small fraction of a second of arc. One thing that may emerge is a confirmation of the suspected diurnal variation in the azimuth error of the transit circle. The determination of the azimuth of the mark is however independent of this, since all that is required in principle is the observation of a star at transit above- and below-pole, together with an observation of the mark at each transit time. In fact these transits may be any odd number of 12 hours apart provided that the rate of the clock is adequately known.

It is rather late in the day to discover such traits in the 100-year old telescope. It does occasion some surprise that, with the distant northern prospect visible from Greenwich, the Chingford or some nearer mark was not made available many years ago. When it was last observed, no practical means of illuminating it existed, and even at Airy's retirement this was still true, but fifty or sixty years ago it might have been done.