OUR ASTRONOMICAL COLUMN.

A PARTIAL ECLIPSE OF THE MOON.—The moon will be in partial eclipse during the early morning hours of Saturday, July 15. The first contact with the shadow occurs at 3h. 19·3m. a.m., the angle from the north point being 40° to E. At Greenwich the moon sets at 3h. 59m. a.m. (one hour later in legal time), nearly 47 minutes before the middle phase.

A BRIGHT METEOR.—A notable meteor was observed at the Hill Observatory, Sidmouth, early on July 8. First seen at 1h. 5m. a.m. G.M.T. a little E. of N. about 15° above the sky-line, rising in the sky, it then passed not quite overhead and reached 30°–40° beyond the zenith. Unfortunately, although the sky was clear and the meteor considerably exceeded Jupiter in brightness, it left no visible trail. The meteor gave the illusory impression of coming quite near to the observer and not of describing a meridian, an effect no doubt largely due to its increasing brilliancy.

COMET 1916*b* (WOLF).—An investigation of the orbit of this comet has been carried out by Messrs. R. T. Crawford and Dinsmore Alter, of the Berkeley Astronomical Department (Lick Obs. Bull., No. 282). From this it appears that Prof. Barnard succeeded in identifying the comet on a photograph taken on April 24. The time of the observation indicates that it must be the same photograph on which a confusion of the minor planet 446 Æternitas with the new comet had been pointed out by the editors of the *Astronomisch Nachrichten* (No. 4845). The earliest position available to the American calculators was that derived from Prof. Barnard's plate. With this and other observations made at Yerkes, May 10 and May 23, the following differentially corrected parabolic orbit has been calculated:—

$$T = 1917 \text{ June } 16{\cdot}4806 \text{ G.M.T.}$$
$$\omega = 120^\circ\ 37'\ 07{\cdot}9'' \qquad \Omega = 183^\circ\ 16'\ 58{\cdot}8''$$
$$i = 25^\circ\ 40'\ 06{\cdot}4'' \qquad \log q = 0{\cdot}226855$$

These elements and the resulting ephemeris only differ slightly from the calculations by Prof. A. Berberich (NATURE, June 1). Numerous American observations, mostly made at Yerkes, are represented closely. The orbit resembles that of Wolf's periodic comet 1884, III., and consequently an elliptic orbit with a period of seven years was calculated; the differences, however, disproved identity. The faint luminosity and low altitude of the comet now probably put it out of reach until it becomes a morning star.

AREQUIPA PYRHELIOMETRY.—In consequence of the recommendations of the Committee of the International Union of Solar Research, measures of solar radiation have been made at Arequipa since 1912. Some of the results so far obtained have been published by C. G. Abbot (Smithsonian Miscellaneous Collection, vol. lxv., No. 9). Special attention has been given to the question of solar variability and atmospheric transmission. At Arequipa the chief factor in the latter connection is the amount of water vapour, and consequently the silver-disc pyrheliometer measures of radiation have been supplemented by a nearly simultaneous series of measures of atmospheric humidity. The monthly mean values show a close connection between the solar radiation and vapour pressure. This was represented by empirical formulæ which gave values of the solar constant in good agreement with the more rigorous values obtained at Mount Wilson and generally confirming the variability of the solar radiation.

The dust of the Katmai eruption (June, 1912) did not affect the Arequipa measures.

CANADIAN ECONOMIC GEOLOGY.[1]

THE White River District of Yukon extends east from the Alaskan-Canadian boundary, and its geology continues that of country well known by the work of the American geologists. Some Carboniferous rocks, resting on an Archean foundation, are followed by thick Mesozoic sediments which contain a few Cretaceous fossils. The Cainozoic is represented by land and fresh-water beds containing lignites. As in Alaska, there are two volcanic series, one of which was erupted during the world-wide disturbances between the Jurassic and Cretaceous, and the other is Upper Cainozoic and continued until very recent though pre-Glacial times. In the early Pliocene the country was uplifted and greatly fractured, the evidence of which is most distinct on the coast. The chief ores of the White River District are of gold and copper. The discovery of the placer deposits at Chisana in 1913 occasioned the greatest "stampede" or mining rush since that to Klondyke in 1897–98. The copper ores have long been worked by the Indians, and in 1891 the exaggerated reports of their quantity led to the first prospecting of the country. Mr. Cairnes's memoir is illustrated by some excellent maps and photographs.

At the opposite corner of Canada, on the southern shore of the Northumberland Strait, is an area strikingly unlike the White River District. It was one of the first Canadian districts geologically investigated; it was settled during the latter part of the eighteenth century, and the names Arisaig, Knoydart, Moydart, Lismore, etc., show that the pioneers were the expatriated exiles from the western Highlands. The district is composed of Palæozoic rocks ranging from the Ordovician to the Upper Carboniferous, with some Ordovician rhyolite lavas and Upper Palæozoic diabase dykes. The surveys of recent years have supplemented and in some respects corrected the earlier results of Dawson and Honeyman. Thus there is a full Silurian sequence, as the Moydart beds represent the Wenlock series, which had been considered absent. The Devonian is represented by the Knoydart series, which is correlated with the British Lower Old Red Sandstone. The absence of the Middle and Upper Old Red Sandstone is attributed to great faulting, that corresponds to that which caused the absence of the Middle series from south-western Scotland. The Carboniferous is represented, as in Britain, by a lower marine series and an upper continental series.

The most interesting economic deposits in this district are the Silurian oolitic ironstones, which the author infers from their special fauna were laid down under unusual conditions, during which the sea contained much ferruginous material. This view is not adequately explained, and there is no proof that the ores were not due to a partial replacement of an oolitic limestone. The report is accompanied by two clear geological maps.

The oil discoveries in the United States in the early 'sixties stimulated research for oil in eastern Canada. Oil was found, though in comparatively small quantities, and some of the districts continued to yield ever since. This oil belt extends from Lake Huron to the Gaspe peninsula, south of the mouth of the St. Lawrence. The most important fields are in the south-western peninsula of Ontario, south of a line from the southern end of Lake Huron to the western end of Lake Ontario. The oils come from various hori-

[1] D. D. Cairnes: Upper White River District, Yukon. Canada, Department of Mines, Geol. Surv. Mem. 50, Geol. Ser., 51, 1915, iv. Pp. 191+xvii plates+3 maps.
M. Y. Williams: Arisaig-Antigonish District, Nova Scotia. *Ibid.*, Mem. 60, Geol. Ser., 47, 1914, vi. Pp. 173+2 maps.
W. Malcolm: The Oil and Gas Fields of Ontario and Quebec. *Ibid.*, Mem. 81, Geol. Ser., 67, 1915, ii. Pp. 248.