Our Astronomical Column.

THE TOTAL SOLAR ECLIPSE OF 1918 JUNE 8.—Vol. lviii., No. 4, of the Proceedings of the American Philosophical Society is entirely taken up with a discussion of the observations made during this eclipse. The photographs taken by the Lowell Observatory Expedition at Syracuse, Kansas, bring out very clearly the connection between the prominences and the coronal arches. It is pointed out that this connection is much easier to trace at sun-spot maximum than at minimum. Dr. Slipher's photographs of the coronal spectrum indicate that coronium is much more abundant in the equatorial than in the polar regions. Messrs. Jakob Kunz and Joel Stebbins were stationed at Rock Springs, Wyoming, and measured the total light of the corona by photo-electric cells. Comparison was made with the full moon through the intermediary of standard candles. Allowing for absorption by the atmosphere, the total light of the corona was 1·07 candle-metres, just half the value found for the full moon. Comparison of the corona with the sky near the sun before and during the eclipse showed that the corona gave 1/10th of the sky light (same area) in full sunshine, and six hundred times the sky light during totality. It is obvious that most of the illumination of the landscape during totality comes, not from the corona, but from the distant regions of the terrestrial atmosphere, which are outside the shadow. Endeavours are being made by Prof. Hale at Mount Wilson to detect the corona in daylight by the use of photo-electric cells.

Mr. John A. Miller, of the Sproul Observatory, describes some researches to detect motion in coronal streamers by comparing plates taken at different stations. Recessions from the sun of 90, 60, and 15 miles per second were indicated for three different streamers. Mr. Miller also states that the forms of many of the streamers can be explained on the supposition that they are projected matter acted on by a repulsive force.

A NOON REFLECTOR.—Prof. C. V. Boys describes in the *English Mechanic* for March 5 an ingenious little instrument which he states to be capable of determining apparent solar time within a second. It is essentially a transit instrument; a small mirror, ¼ in. in diameter, is mounted on an axis about 2 in. long, with cylindrical ends which rest in two Y's, mounted on a stand which is capable of being firmly fixed in a window of southern aspect. Full details and drawings of the various parts are given in the article, with instructions which should enable any person with a mechanical bent to construct it. Small movements for fine adjustment in level and azimuth are allowed for in the design. Some protecting cover and some means of fixing firmly after adjustment is secured are also demanded, as it is somewhat tedious and troublesome to adjust it with high accuracy. The mirror is so small that the reflection of the sun on the opposite wall is fairly well defined, like a pinhole image, and the author states that he has frequently been able to see large sun-spots clearly. There is a certain amount of penumbra, but by practising uniformity in observing either the inside or the outside of the penumbral fringe the time of transit of the sun's centre may be determined to a second. The meridian is marked by a line on the north wall of the room; the noon image of the sun may be brought to the same point at all times of the year by rotating the mirror axis in the Y's.

American Fossil Vertebrate Animals.

AMERICAN palæontologists are making good progress with their detailed studies and descriptions of the original type-specimens of the various species of extinct vertebrate animals found on their continent. Most of the first descriptions were necessarily hurried and superficial, often unaccompanied with figures, and they are scattered in numerous small publications. Later discoveries have indicated more clearly the features that are of special significance and need particular attention in each case, so that new descriptions are of fundamental importance for exactitude in the science. Realising this, Prof. H. F. Osborn has just completed a valuable work by bringing together a series of up-to-date technical descriptions and figures of all the type-specimens of fossil horses from the Oligocene, Miocene, and Pliocene formations of North America (Memoirs of the American Museum of Natural History, new series, vol. ii., part i.). He not only deals with every species on a uniform plan, but also discusses in ample detail the correlation of the various formations from which the fossils were obtained. Besides reproducing the original figures already published, he adds many more, and among these the pencil drawings by two Japanese artists are especially noteworthy. A series of new drawings collected to illustrate the evolution of the upper and lower molars of the horses is a welcome compendium.

Other fossil mammals are described and discussed in the sixth volume of papers on vertebrate palæontology extracted from the Bulletin of the American Museum of Natural History, 1915–17. We noticed some of these contributions at the time of their publication, and we are glad to have them so conveniently collected. Several notes on the mammalian remains of the Lower Eocene by Messrs. W. D. Matthew and W. Granger add to our knowledge of the type-specimens by comparison with later discoveries, which are described and illustrated in detail. The paper on the Eocene Notharctus by Messrs. W. Granger and W. K. Gregory is also fundamentally important for a discussion of the origin of the Primates. In another valuable memoir Dr. Gregory pursues this subject, and reviews our present knowledge of the fragmentary fossils which seem to afford some information as to the origin of man.

The skeleton of Diatryma, a heavy running bird 7 ft. high, from the Lower Eocene of Wyoming, is described by Messrs. Matthew and Granger as representing a new order of uncertain relationships. Some of the Cretaceous Dinosaurs described by Prof. Osborn are also remarkably bird-like; and the wonderfully preserved Corythosaurus described by Mr. B. Brown, though evidently an amphibious Dinosaur related to Iguanodon, has a bony crest which would make the outward shape of its head like that of a cassowary.

In the volume from the American Museum there are also some notes on the gigantic Dinosaurs related to Diplodocus, but a still more important contribution to our knowledge of these reptiles is Prof. R. S. Lull's detailed description of Barosaurus in the Memoirs of the Connecticut Academy (vol. vi., pp. 1–42, pls. i.–vii.). Barosaurus seems to have a longer neck and shorter tail than Diplodocus, but is otherwise very similar to the latter. The gigantic Sauropoda, indeed, are not easily classified, and we still need many more technical descriptions like that before us.

Some of the type-specimens of the Permian and Triassic reptiles are also redescribed and discussed by Baron von Huene and Mr. D. M. S. Watson in the Bulletin of the American Museum; but the most