

an electric discharge would first illuminate the atmosphere of the comet, or even carry some of the solid material off in a state of vapour, and then pass off to the surrounding medium. Thus while the spectrum from the head would be that of cometary matter, the tail would be due to the incandescent ether. I would here suggest that gas, when rendered incandescent by electricity, may reflect light—it will certainly cast a shadow from the electric light—and if this be the case, part of the light from comets' tails may after all be reflected sunlight. At any rate, it is certain that the appearance of streamers, the rapidity of change and emission, the perfect transparency and the wave-like fluctuations which belong to these phenomena, are all exhibited by the electric brush; in fact, the electric brush will explain all these appearances which have defied all attempts at explanation on a material hypothesis. I have only to add that the main assumption involved in the electric theory is that space is occupied by matter having similar electrical properties to those of gas; and I would ask, is it not more rational to make such an assumption than it is to attribute unknown and inconceivable properties to cometary matter? Theories, even if founded only on rational speculation, often, I believe, prove very useful, inasmuch as they afford observers a definite purpose in their observations—something to look for, something to establish or to refute; and I publish these speculations of mine at this particular moment in the hope that they may perchance serve such a purpose.

PHILADELPHIA

American Philosophical Society, October 7.—Dr. Binton made some observations on a Mazahc theological work and grammar, indicating probable resemblances between the language of that nation and that of the Aztecs. He also described a grammar of the Moska nation of New Granada, prepared by Father Lugo.—J. A. Macneil described the ruins and other remains of the ancient nations, which he had discovered during several expeditions in Nicaragua, Costa Rica, Chiriqui, and Chiapas. He made especial reference to an extensive series of ruins he had discovered near the boundaries of Chiriqui and Costa Rica. One of the buildings was 600 feet in length, and 25 to 30 feet elevation. Among other sculptures he observed a well-executed stone alligator of large size.—Prof. Cope exhibited the remains of a new cretaceous tortoise, of the genus *Adocus* Cope, to be called *A. syntheticus*. He explained that he had been able to establish more fully the characters of the genus *Adocus*; that it was found to possess an intergular shield as in the Pleurodira, but had not the sutural union of the inferior pelvic elements with the plastron of that type. He said that these characters had been heretofore known as correlatives from the cretaceous period to the present day, and that this genus presented us with the first exception to the rule. The genus was therefore regarded as a generalised type, and to be elevated to the rank of a family. Prof. Cope exhibited a metatarsus of *Tadpoles aquilunguis*, the first known, and said it proved the distinctness of those elements from each other in that type, and their slenderness, taken collectively. The specimen was an external one, without trace of a rudimental one outside of it; that its measurement, 16 inches, was indicative of a length of 18 inches to the median metatarsus, a length he had already assigned to it on theoretical grounds. Prof. Cope read a paper entitled, "Contribution to the Ichthyology of the lesser Antilles." Two new genera were described in it, viz., *Eleutheractis* and *Cryptotomus*.

Academy of Natural Sciences, November 8.—Prof. Leidy characterised three species of extinct turtles, obtained by Prof. Hayden's party from the tertiary deposits of Wyoming. Two were named *Emys Haydeni* and *E. Jeanae*. The third, partaking of characters of the genera *Chelydra* and *Dermatemys*, was named *Baena arenosa*. A lacertian, as large as the largest of our living Iguanas, was characterised from the greater part of the bones of a skeleton imbedded in a rock of tertiary age, from Wyoming. The vertebrae have the characteristic ball and socket-joint to the bodies, but they are devoid of the zygosphenes and zyganthrum. The teeth are compressed conical, slightly curved, sharp-pointed, and trenchant. The remains were referred to a species with the name of *Saniwa ensidens*. The names *Baena* and *Saniwa*, according to Prof. Hayden, are those given to the turtle and lizard by one of the aboriginal tribes of the Upper Missouri.

VIENNA

I. R. Geological Institute, December 6.—Dr. Laube presented a memoir on "the Echinidae of the Upper Tertiary De-

posits in the Austro-Hungarian Empire," which will be printed in the fifth volume of the Memoirs of the Institute. The total number of distinct species is 37, six of which belong to the lower, and 31 to the upper part of the Mediterranean formation.—M. F. Foeterle "on the Sarmatic formation in the Bukowina and Northern Moldavia." It occupies an enormous space in both countries, and is easily divided in two members, an upper formed of yellow sand and sandstone, and a lower which consists of blue clay. Both contain fossils in abundance. The clay is everywhere permeated with very thin veins and layers of fine sand, which give free access to water, and thus cause the greatest difficulties for the railroad between Czernowitz and Jassy, which for long tracts passes over the clay, and is damaged by very long continued falls of rain.—M. Th. Fuchs reported on the Fauna of the Congerias beds of Tihany and Kup in Hungary.—M. Ch. v. Hauer communicated the analysis of fire-proof clay of Fohnsdorf (Styria) which forms there a layer 9 feet thick in the browncoal basin. It consists of a hydrosilicate of alumina and magnesia, and belongs to the so-called soap-stones.—M. E. Tietze gave notice of the discovery of fossiliferous beds belonging to the brown Jura at Boletin, in Servia, and of neocomian and turonian beds in north-eastern Servia.—M. M. Neumayr presented a memoir on the jurassic flint-limestones of the Carpathians.—M. D. Stur exhibited a magnificent collection of eocene fossils from the environs of Vicenza, which had been purchased for the Museum of the Institute.

DIARY

FRIDAY, JANUARY 6.

GEOLOGISTS' ASSOCIATION, at 8.

SATURDAY, JANUARY 7.

ROYAL INSTITUTION, at 3.—Burning and Unburning: Prof. Odling (juvenile lectures).

SUNDAY, JANUARY 8.

SUNDAY LECTURE SOCIETY, at 3.30.—Malta and the Maltese, with a visit to St. Paul's Bay: Dr. Carpenter.

MONDAY, JANUARY 9.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.

TUESDAY, JANUARY 10.

PHOTOGRAPHIC SOCIETY, at 8.

ETHNOLOGICAL SOCIETY, at 8.—On the Prehistoric Remains in Brittany: Lieut. S. P. Oliver, R.A.—Exhibition of Stone Implements from Queen Charlotte's Is and: Dr. Hooker, C.B.—On a Cairn near Cefn, St. Asaph: Rev. D. R. Thomas, M.A., and Mr. T. McK. Hughes, M.A.

WEDNESDAY, JANUARY 11.

GEOLICAL SOCIETY, at 8.—On the older Metamorphic Rocks and Granite of Banffshire: Mr. T. F. Jamieson, F.G.S.—On the Connection of Volcanic action with Changes of Level: Mr. J. J. Murphy, F.G.S.—On the Geology of the neighbourhood of Malaga: Don M. de Orueba.

ROYAL MICROSCOPICAL SOCIETY, at 8.—On the Anatomy of *Ascaris lumbricoides*: Mr. E. T. Lowe, M.R.C.S.—On the use of Colloidal Silica in preparing Crystals for the Polarising Microscope: Mr. H. J. Slack.

THURSDAY, JANUARY 12.

ROYAL, at 8.30.

SOCIETY OF ANTIQUARIES, at 8.30.

London MATHEMATICAL SOCIETY, at 8.—On Systems of Tangents to Plane Cubic and Quartic Curves: Mr. J. J. Walker.—On the Order and Singularities of the Parallel of an Algebraical Curve: Mr. S. Roberts.

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