

taining it from the freezing mixture in which it had been immersed. Such was the force of this explosion that every glass vessel in the vicinity was completely shattered by the concussion, and it is a matter of great regret that Herr Radenhausen was seriously injured by it. As regards the relative strength of the acid, Prof. Ostwald, who has made determinations of its conductivity, finds that it is a little stronger than acetic acid. In reply to the recent suggestion of Prof. Mendeleeff that the ammonium salt of azoimide, N_3NH_4 , might possibly undergo an isomeric change analogous to the conversion of ammonium isocyanate into urea, it is shown that this is not the case. The ammonium salt is a substance crystallizing in beautiful large prisms which possess the property of continually diminishing in size and eventually of entirely disappearing, owing to spontaneous sublimation. Neither sublimation nor boiling with water effect any change of constitution whatever.

THE additions to the Zoological Society's Gardens during the past week include a Red Deer (*Cervus elaphus* ♀), British, presented by Mr. C. J. H. Tower, F.Z.S.; six Night Herons (*Nycticorax griseus*), European, presented by Mr. A. A. van Bemmelen; a Spotted Eagle Owl (*Bubo maculosus*) from South Africa, presented by Mr. Julius Wilson; a Redwing (*Turdus iliacus*), British, presented by Mrs. J. B. Capper; two Yellow-throated Rock Sparrows (*Petronia petronella*) from Africa, deposited; seven Knots (*Tringa canutus*), two Bar-tailed Godwits (*Limosa lapponica*), European, purchased.

OUR ASTRONOMICAL COLUMN.

VARIABILITY OF THE ANDROMEDA NEBULA.—The January number of the *Monthly Notices of the Royal Astronomical Society* contains a note by Mr. Isaac Roberts, entitled "Photographic Evidence of Variability in the Nucleus of the Great Nebula in Andromeda." Between 1885 and 1890 a dozen photographs of this object were taken on several plates; and especially on three negatives taken with exposures of 5, 15, and 60 minutes in December 1890, the nucleus of the nebula has a decidedly stellar appearance. Other plates, exposed for both short and long intervals of time, show no trace of a stellar nucleus. It may therefore reasonably be inferred that the nucleus of the nebula is variable.

ECCENTRICITIES OF STELLAR ORBITS.—In the current number of *The Observatory* Dr. T. J. J. See points out that the arithmetical mean eccentricity of 50 of the best stellar orbits hitherto computed is 0.5, while the mean eccentricity for the orbits of the planets of our system is less than one-tenth of this fraction. A discussion of binary systems has led the author to the conclusion that the great eccentricities observed have been developed by the continual action of tidal friction. The elongated forms of most stellar orbits, and the relatively large mass-ratio of the components of a system, are so different from the orbits and relative masses in the solar system that "the development of the solar system seems to have been an exception and not the rule. From these considerations the writer would venture the opinion that investigators of cosmogony who have looked upon the solar system as typical of the general process of cosmic development, and proceeded therefrom to investigate stellar evolution in general, have pursued an erroneous path."

A NEW NEBULA NEAR MEROPE.—Mr. E. E. Barnard, of Lick Observatory, contributes a note "On the Nebulosity of the Pleiades, and on a New Merope Nebula," to *Astronomische Nachrichten*, No. 3018. Whilst examining the Pleiades on November 14, 1890, Mr. Barnard discovered a new and comparatively bright round cometary nebula close south and following Merope. Since this date the nebula has been observed several times and its position determined. The reason why such a comparatively bright object has never been photographed is that the exposure which it would require to impress itself upon the photographic plate would over-expose Merope so much that the light of the two would coalesce.

NAMES OF ASTEROIDS.—Dr. Palisa has given the following names to asteroids discovered by him last year:—

- (290) Bruna, discovered March 20, 1890.
- (291) Alice, " April 25, "
- (292) Ludovica, " " " "
- (293) Theresia, " August 17, "

THE BRITISH MOSSES.¹

I.

I CANNOT lay the following paper before the readers of NATURE without repeating an apology which I addressed to my audience at the Royal Institution on this subject. I can make no pretence to speak with authority; I speak only as a learner who has devoted to the subject some leisure from amidst avocations of a very different kind. But the pleasure I have derived from the study, the sense, whenever I am in the country, that I am surrounded with a world of variety and beauty of which I was formerly only dimly conscious, and the hope of communicating some of this pleasure to others may, I hope, furnish some apology for my venturing to speak on the subject.

Classification.—Without entering into any question as to the best classification of the mosses, or the relative systematic value of the different groups, the following table, which is arranged in an ascending rank, will be sufficient to show the position of the mosses in the vegetable kingdom, and the principal groups into which they may be divided:—

TABLE A.

Vascular Cryptogams	Series.	Orders.	Examples.
Muscineæ	i. Musci	Pleurocarpæ	Hypnum
		Acrocarpæ	Polytrichum Phascum
	ii. Sphagnaceæ	Anomalæ	Schizocarpæ Holocarpæ
	iii. Hepaticæ	Jungermanniaceæ Marchantiaceæ	
Algæ, &c.			

From this table it will be gathered that the mosses, using that word in its wide signification, stand at the head of the cellular cryptogams, and that above them are the vascular cryptogams, of which the ferns are one of the best-known groups. From these vascular cryptogams the mosses are, however, separated by a distance which Goebel has described as a chasm "the widest with which we are acquainted in the whole vegetable kingdom."

From the table it will be further seen that the larger group of the Muscineæ divides itself into three principal smaller groups: the Hepaticæ or liverworts, the Sphagnaceæ or turf mosses, and the Musci or true mosses—urn-mosses, as they have been called, from the form of their capsule. Passing over the other subdivisions, it may be observed that the Acrocarpous mosses are those which carry their capsules at the end of the axis of growth, whilst the Pleurocarpous mosses bear their fructification on stalks, more or less long, proceeding from the sides of the axis. Amongst these Pleurocarpous mosses occurs the old (broken up by modern systematists into several genera) genus Hypnum, the largest of all the genera in these islands or in Europe—a vast group which occupies amongst mosses something like the place which the Agarics occupy amongst the Fungi.

Number of British Species.—If we were to try and ascertain the number of the British Muscineæ from the systematists of some few years ago, like Hooker and Wilson, the species would number between 500 and 600; but according to the views of more recent writers, the number would probably rise to something between 800 and 900. The true mosses are the most numerous, the turf-mosses by far the fewest.

Date of Flora.—What is the date of this moss flora of Britain? Three ancient collections enable us to give some

¹ The substance (with omissions and additions) of a Discourse by the Right Hon. Lord Justice Fry, delivered at the Royal Institution, January 23, 1891.