from which the solitary worker shrinks, but which are, nevertheless, essential to the development of chemistry. Brilliant discoveries might be made in them, but incidentally, and not as their main purpose.

THE table of atomic weights issued annually by the international committee appears in the January number of the *Berichte*, and the table, based upon oxygen = 16, is unaccompanied by the didactic table with hydrogen = 1. The withdrawal of the didactic table is in accordance with a widely expressed wish. It is generally felt that if oxygen is to be taken as 16 for any purpose it should be taken as 16 for all purposes. Discussing this subject in a paper recently contributed to the American Society of Sciences and Arts, Prof. Richards made a strong appeal to chemists to conform to the decision of the international committee. He pointed out that oxygen has actually served as the experimental standard of reference in a great majority of cases, that the great bulk of valuable work has already been published on the basis oxygen = 16·000, and that the use of this standard involves no important didactic difficulties. He contends that the decision of the representatives of the international committee is in itself an important reason for adopting this standard, and that uniformity of usage is more important than any of the special advantages claimed by either side in the discussion. The only alterations of atomic weights in this year's table are of calcium from 40 to 40·1, iron from 56 to 55·9, and tellurium from 127 to 127·6.

THE additions to the Zoological Society's Gardens during the past week include two Guinea Baboons (*Cynocephalus sphinx*), a Red-footed Ground Squirrel (*Xerus erythropus*) from West Africa, presented by Captain R. H. Wilford; a Snow Leopard (*Felis uncia*) from Northern India, presented by Captain H. Nicholl; two Half-collared Turtle Doves (*Turtur semitorquatus*) from West Africa, presented by Captain Thorne; a Ring-necked Pheasant (*Phasianus torquatus*) from China, presented by Mr. B. Tufnell; seven Black-headed Gulls (*Larus ridibundus*), a Common Gull (*Larus canus*), European, presented by Mr. E. J. W. Eldred; a Green Monkey (*Cercopithecus callitrichus*), an Erxleben's Monkey (*Cercopithecus erxlebeni*), eight West African Love-Birds (*Agapornis pullaria*) from West Africa, a Greater Sulphur-crested Cockatoo (*Cacatua galerita*) from Australia, a Levaillant's Amazon (*Chrysotis levaillanti*) from Mexico, ten Common Toads (*Bufo vulgaris*), European, a Loggerhead Turtle (*Thalassochelys caretta*) from Tropical Seas.

OUR ASTRONOMICAL COLUMN.

ASTRONOMICAL OCCURRENCES IN MARCH.

Mar. 3. 22h. Vesta in conjunction with the moon. Vesta 0° 35′ S.
5. 15h. Saturn in conjunction with the moon. Saturn 5° 1′ S.
6. 14h. Jupiter in conjunction with the moon. Jupiter 5° 41′ S.
7. 7h. Venus in conjunction with the moon. Venus 2° 11′ N.
12. 10h. 12m. Minimum of Algol (β Persei).
15. 7h. 1m. Minimum of Algol (β Persei).
15. Venus. Illuminated portion of disc = 0·198, Mars = 1·000.
17. 2h. 0m. Mercury at greatest elongation (27° 41′ W.).
17. 9h. 19m. to 10h. 16m. Moon occults 26 Geminorum (mag. 5·1).
18. 5h. 48m. to 6h. 14m. Moon occults 68 Geminorum (mag. 5·0).
18. 15h. 19m. to 18h. 58m. Transit of Jupiter's Sat. III.
20. 8h. 27m. to 9h. 43m. Moon occults ω Leonis (mag. 5·6).
20. 19h. 0m. Venus at maximum brilliancy.
Mar. 21. 1h. 0m. Sun enters Aries. Spring commences.
21. Saturn. Outer minor axis of outer ring = 13″·75.
22. 11h. 19m. to 12h. 24m. Moon occults p^5 Leonis (mag. 5·5).
28. 13h. 41m. to 15h. 0m. Moon occults ν Scorpii (mag. 4·5).
29. 13h. Mars in conjunction with sun.

OBSERVATIONS OF 900 DOUBLE AND MULTIPLE STARS.—The first of the astronomical series of publications from the University of Pennsylvania consists of the measures of 900 double and multiple stars made by Prof. Doolittle with the 18-inch refractor of the Flower Observatory. These observations were made during the period 1897 January 1 and 1900 October 15. In all cases a power of 592 diameters was employed. Twenty-two of the stars are now catalogued for the first time, having been discovered during the observation of neighbouring doubles.

The 18-inch objective is the largest lens made by Brashear up to the present time, and has given every satisfaction, both as to resolving and light-grasping power. The mounting, by Warner and Swasey, is of similar construction to the Lick and Yerkes instruments (*Publications of the University of Pennsylvania, Astronomical Series*, vol. i. part iii.)

OBSERVATIONS OF 194 DOUBLE STARS.—*Bulletin* No. 11 from the Lick Observatory contains a list of observations made by Mr. R. G. Aitken during 1900 and 1901 with the 36-inch and 12-inch refractors. Many of the stars are difficult pairs, and in most cases the 36-inch telescope was employed, with powers ranging from 1000–2400.

RADIO-ACTIVITY AND THE ELECTRON THEORY.[1]

ELECTRONS emanating from radio-active bodies behave like material particles, and are impeded by the molecules of the surrounding medium, in contrast with ether waves, which are not thus affected except by absorption. It is not difficult to put these indications to test. A pair of shallow cells, A B (Fig. 1), 1·5 mm. deep and 25 mm. square, were made by cementing slips of glass to a thick glass plate. The cells were filled to the same depth with a radio-active substance chiefly containing actinium.[2] Over cell A was placed a piece of thick lead pipe, 28 mm. high and 25 mm. internal diameter, to ensure that any emanations from the active substance in A would be confined to the inside of the hollow cylinder. The radio-active substance in B was freely exposed to the air, save for a pillar of lead at C, to support the sensitive film. A sensitive film was laid horizontally over the cylinder and support C. On the film was a plate of glass, and cylinder and film were pressed together by heavy weights. The whole was covered in a light-tight box and put in a dark cupboard.

At the end of forty-eight hours the film was removed and developed. There was a strong action shown over cell A (the one covered by the lead cylinder), but over B, the cell exposed to the air, there was no visible impression. Measured in Mr. Chapman Jones's "Opacity Meter"[3] the results were:—

Image over cylinder—Opacity log.[4] = ·79; Opacity[5] = 6·17.

The experiment was repeated, using the same apparatus, but a different preparation of actinium. In this case the exposure was for seventy-two hours. As before, there was a strong impression over cell A and none over cell B. The figures were:—

Opacity log. = ·89; Opacity = 7·71.

These experiments indicate that the electrons from the radio-active agent, chiefly actinium, partake of the properties of a fog or mist of material particles, capable of diffusing away in the free air like odoriferous particles, when not kept in by a thick metal screen.

A further experiment was now tried with the same apparatus, the agent a strongly active radium and barium bromide. This material being self-luminous, a sheet of black paper was placed

[1] By Sir William Crookes, F.R.S. A Paper read before the Royal Society on February 6.

[2] The body I called Uranium X in my Royal Society paper, May 10, 1900, has since proved to be M. Debierne's Actinium.

[3] *The Photographic Journal*, vol. xx. p. 86, December 21, 1895.

[4] The opacity logarithm represents the density of the image, absolute density being represented by 2·00.

[5] The "opacity" is the whole number corresponding to the "opacity log." The "opacity" is directly proportional to the photographic energy acting on the sensitive surface.