us contains, in addition to the annual address by the retiring president, Prof. A. Liversidge, F.R.S., three contributions by the new president, Mr. H. C. Russell, F.R.S., one of which briefly discusses the relation between the moon's motion in declination and the quantity of rain in New South Wales, in which the author is convinced that "seeing the rain is shown so clearly to come in times of abundance, when the moon is in certain degrees of her motion south, and when the moon begins to go north, then droughty conditions prevail for seven or even eight years, a phenomenon repeated for three periods of nineteen years each, that it is either a marvellous coincidence, or there is a law connecting the two phenomena." Mr. R. H. Mathews contributes an important paper on "The Thurrawal Language," and shorter accounts of some aboriginal tribes of Western Australia and of rock-holes used by aborigines for warming water. Mr. J. H. Maiden, Government Botanist and Director of the Botanic Gardens, Sydney, gives an exhaustive summary of the gums, resins and other vegetable exudations of Australia, as well as interesting historical notes relating to the death of Captain Cook. Mr. G. H. Knibbs also writes two important papers, that on a theory of city design being of wide interest. These papers by no means exhaust the important contributions to science contained in the volume, but since reports of the proceedings of the Society regularly appear in our columns under "Societies and Academies," it is unnecessary to refer at any greater length to the scientific work being done in New South Wales.

THE additions to the Zoological Society's Gardens during the past week include two Vervet Monkeys (*Cercopithecus lalandii*) from South Africa, presented by Miss Barlow; an Equine Antelope (*Hippotragus equinus*) from Bechuanaland, presented by Major Chas. Fredk. Minchin, D.S.O.; three Fat Dormice (*Myoxus glis*) European, presented by Dr. L. H. Gough; a Mongoose Lemur (*Lemur mongoz*) from Madagascar, two Mexican Snakes (*Coluber melanoleucus*) from Mexico, deposited; two Snake Fishes (*Polypterus senegalus*) from Fashoda, received in exchange.

ERRATUM—In parenthesis near the end of letter on "Summer and Winter" (p. 81), "The average mean temperature of summer below 61°·2," for *below* read *being*.

OUR ASTRONOMICAL COLUMN.

OBSERVATIONS OF THE PERSEID SHOWER.—Herr Koss, director of the Pola Observatory, communicates to No. 3830 of the *Astronomische Nachrichten* the results of the observations of Perseids made at that observatory on August 8, 9 and 10.

The times of appearance, the exact path, the magnitude and the time of duration of each meteor are recorded for ten Perseids seen on August 8, sixteen seen on August 9, and thirty-three seen on August 10. In addition to these, thirteen Perseids and sixteen sporadic meteors were seen, but not mapped.

The position of the radiant point for August 9 and for August 10 was estimated to be $\alpha = 2h.\ 32m.$, $\delta = +56°{\cdot}5$ and $\alpha = 3h.\ 2m.$, $\delta = +54°{\cdot}5$, respectively

NEW VARIABLE STAR, 16, 1902, DELPHINI.—From photographs taken at Moscow by M. S. Blakjo, Madame Ceraski has found that the star B.D. + 16°·4290, having the position $\alpha = 20h.\ 25m.\ 59s.{\cdot}5$, $\delta = +16°\ 57'{\cdot}2$ (1855), is a variable.

In the catalogue, the magnitude of this object is given as 9·3, and this was confirmed on a negative taken on August 18, 1900. On a plate obtained on August 17, 1901, however, the star does not appear, and, according to the magnitudes of the neighbouring stars which do appear, it must therefore have been fainter than the eleventh magnitude. Visual observations confirmed this latter value (*Astronomische Nachrichten*, No. 3830).

EVOLUTION OF AËROGRAPHY.—In No. 170 of the *Proceedings* of the American Philosophical Society, Mr. Percival Lowell reviews the various steps which have taken place in our knowledge and mapping of the surface of Mars.

By a series of twelve maps, arranged in chronological order, he shows the gradual development in the amount of detail seen and recorded, from the map of Beer and Madler, published in 1840, to that published by himself in 1901. From comparisons of these maps, he divides the history of aërography into three periods, viz., 1840–1876, large dark and light markings shown; 1877–1892, "canals" in bright regions detected; 1893–1902, "canals" in the dark regions detected; and also draws the following three deductions therefrom:—(1) The series agree fundamentally. (2) The regularity of the "canals," as recorded by Schiaparelli, was not due to any predisposition on the part of that observer, but was gradually forced upon him as he became more familiar with the surface of the planet. (3) All the maps show a general evolution, from simple to complex, in the detection of the surface markings of the planet.

A SIMPLIFIED FORM OF FOUCAULT'S PENDULUM.—The reinstallation of Foucault's famous experiment at the Pantheon by MM. Berget and Flammarion has, according to M. D'Arsonval, called forth many ingenious devices for proving the same result by means of a simpler apparatus.

Of these devices, M. D'Arsonval describes, in the *Comptes rendus* for November 17, the one which, in his opinion, is the simplest and best.

The main point of this device is the simplicity of the method of suspension. A steel wire, 0·035mm. in diameter, carries a leaden ball, which is covered with copper and weighs about 2¾ lbs., and is fixed to the ceiling by an ordinary nail. Its upper end is then clamped in a metal block, so that it is immovable above the lower face of the block, but free to swing about the point where it enters this face from below, and the block is then screwed to the ceiling or other suitable support. A pendulum suspended in this manner is capable of swinging for about three hours.

The whole apparatus is contained in a small wooden box, which also carries the sand in which the pendulum pointer marks the trace of its plane of swing, and is accompanied by a small model pendulum, which may be used to illustrate the principle of the invariability of the plane of oscillation.

The simplicity, the compact form and the low price (20 francs) of this device should render possible its use in schools and colleges, where hitherto the students have had to depend upon descriptions and illustrations for their knowledge of this important experiment, or else pay a visit to the western galleries of the Victoria and Albert Museum, where a large model may always be seen and, if formal representations be made to the authorities, demonstrations may be given.

PHYSICAL CHEMISTRY APPLIED TO TOXINS AND ANTITOXINS.

A VERY important contribution to our knowledge of the toxins and antitoxins is contained in the "Festskrift" recently published to celebrate the inauguration of the State Serum Institute at Copenhagen, in the form of a paper with the above title by Arrhenius and Madsen. In passing, we note with pleasure that English has been chosen as the international linguistic medium for the entire contents of the volume. The necessity for collaboration between the representatives of different branches of science for the satisfactory study of many of the complex problems of physiology, bacteriology and pathology is gradually becoming generally recognised, and in the present instance we have a striking example of the joint work of two celebrated investigators on a subject lying on the common boundary of their special provinces of knowledge and experience.

It is well known that tetanus toxin, prepared by filtering off the bacteria from a broth culture and saturating with ammonium sulphate, contains two distinct toxic substances, a *spasmin*, which produces the characteristic convulsions, and a *lysin*, which hæmolyses the red blood corpuscles of many animals. In the same way, the antitoxin produced in the serum of animals immunised against tetanus contains two distinct antitoxic substances, an *antispasmin* and an *antilysin*.

It has, moreover, been shown by Madsen that experiments on the properties and mutual relationships of the tetanus lysin and antilysin can be performed with great facility and comparatively great accuracy on blood *in vitro*, the uncertainty attendant upon animal experiments and the great expenditure of time required by them being thus avoided.

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