

We notice that no denomination is given to the weights of seeds in the table on p. 47, though pounds, of course, are intended.

MESSRS. MACMILLAN AND CO. have made arrangements for the issue in New York and London of a "Dictionary of Philosophy and Psychology," under the editorial supervision of Professor Baldwin of Princeton University. All the matter in the Dictionary will be original and signed, and the several departments will be entrusted to men most competent to deal with them.

WRITING with reference to the diagram published in NATURE of February 27 (vol. liii. p. 404), to illustrate the movements of the terrestrial pole determined by Prof. Albrecht, Mr. T. W. Kingsmill points out that the irregular variations in the curve are apparently coincident with remarkable seismic disturbances. He therefore suggests that there is a connection between movements of the earth's axis and unusual seismic activity.

WE have received two more of the valuable publications of the Geological Survey of Canada, forming Parts B and M of Annual Report, vol. vii. The first of these is a Report on the Kamloops map-sheet of British Columbia, by Dr. G. M. Dawson. It is accompanied by two maps of the area, one strictly geological, the other glacial and economic, and the Report itself contains a number of reproductions of photographs of the district. The rocks of the area range from Cambrian to Tertiary and later, and are described at length; while topographical, meteorological, and mineralogical observations are also recorded. The whole volume consists of over 400 pages. The second is a Report by Mr. R. Chalmers on the surface geology of parts of New Brunswick, Nova Scotia, and Prince Edward Island. Besides minor matters of local interest, it includes discussions on the origin of the Bay of Fundy depression, the glacial striae of the district, and the destruction of the forests. Several maps accompany the Report; and a photograph of the famous tidal bore in the Petitcodiac River, Bay of Fundy, deserves special mention.

TRUE it is that at the Royal Victoria Hall, in Waterloo Bridge Road, music and mummery occupy a larger share of attention than lectures on scientific subjects. South London audiences have but a mere *penchant* for the generous new wine of science; they reserve their capacities for the variety entertainments. But though the audiences on Tuesday evenings, when scientific discourses are delivered, are very much smaller than on the evenings when a lighter vein predominates, they listen in a way which shows that they appreciate the fare provided for them. And it is satisfactory to know that most of the lecturers are in the front rank of scientific investigators, for this fact may be taken as a guarantee that sound information is imparted. The list of lecturers and subjects given in the report on the work of the Hall during 1895 is most creditable to the energy of Miss Cons, the Secretary, and to the generous spirit of the men of science who gave their services.

FOLLOWING up the work which resulted in the preparation of the phosphoryl chlorobromides, M. Besson (*Comptes rendus*, May 11), by a similar method, has succeeded in preparing the corresponding thiophosphoryl derivatives. A mixture of hydrobromic acid and thiophosphoryl chloride passed over pumice at 400°-500° C. yields a liquid from which it is possible, by fractional distillation under reduced pressure (60 mm.), to separate both the intermediate chlorobromides. These substances resemble in their general behaviour the corresponding phosphoryl compounds. They undergo partial decomposition when distilled under ordinary atmospheric pressure, and are slowly acted upon by water. The chloromonobromide, (PSCl₂Br), has been previously obtained by Michaelis by the action of bromine upon PSCl₂(OC₂H₅), but his product seems to have been impure.

THE additions to the Zoological Society's Gardens during the past week include a Bonnet Monkey (*Macacus senicus*, ♀) from India, presented by Mr. F. Greswolde-Williams; a Red-fronted Lemur (*Lemur rufifrons*, ♂) from Madagascar, presented by Mr. E. A. Pardoe; a Grison (*Galictis vittata*), a Black Tortoise (*Testudo carbonaria*), a Brazilian Tortoise (*Testudo tabulata*), a Rough Terrapin (*Clemmys punctularia*), two Scorpion Mud Terrapins (*Cinosternon scorpioides*) from South America, presented by Mr. J. J. Quelch; a Lesser Kestrel (*Tinnunculus cenchris*), captured off the coast of Sicily, presented by Mr. J. L. Spaul; a Natal Python (*Python sebae*, var. *natalensis*), a Ring-hals Snake (*Sepedon hamachetes*) from South Africa, presented by Mr. W. Champion; a Common Viper (*Vipera berus*), British, presented by Mr. H. L. C. Barret; eight Esquimaux Dogs (*Canis familiaris*), Arctic Regions, deposited; a Pied Crow Shrike (*Strepera graculina*) from Australia, two Whooper Swans (*Cygnus musicus*), European, purchased; two Barbary Wild Sheep (*Ovis tragelaphus*), born in the Gardens.

ERRATUM.—In the letter entitled "Simple Huyghens' Apparatus for the Optical Lantern," in the issue of NATURE for April 9, instead of "a thickness of 1½ inches or more," read "of ½ inch or more."

OUR ASTRONOMICAL COLUMN.

THE SYSTEM OF CASTOR.—A very interesting discovery with regard to this well-known binary star has been made by Dr. Belopolsky (*Bull. Acad. Imp. Sci. St. Petersbourg*, vol. iv. No. 3). In addition to the two luminous bodies, which perform their revolution in a period of about 1000 years, Dr. Belopolsky's observations indicate that the brighter star, α_1 Geminorum, has a dark companion very similar to that of Algol, except that it never produces eclipses. The existence of this dark body was suspected in 1894, and it was fully confirmed by photographs of the spectrum taken at Pulkowa early in the present year, showing periodic changes in the velocity of the star along the line of sight. Thirteen photographs were obtained, and from these the velocities of α_1 Geminorum towards or away from the sun were deduced. Although the available data are insufficient for a complete determination of the orbit, it may be taken to be circular as a first approximation, and a period of revolution of 2.98 days sufficiently accords with the spectroscopic measurements. The proper motion of the system of α_1 is 1.0 geographical mile (= 4.6 English miles) per second away from the sun, while the relative orbital velocity is 4.5 geographical miles (20.7 English miles) per second.

Dr. Belopolsky also tabulates the wave-lengths of some of the principal lines in the spectrum of α_1 Geminorum, which somewhat resembles that of Sirius in having broad lines of hydrogen, and many finer lines which are chiefly due to iron. α_2 Geminorum gives a spectrum with less numerous lines.

EFFICIENCY OF PHOTOGRAPHIC TELESCOPES.—Dr. Isaac Roberts has recently conducted an important series of experiments with the view of ascertaining the relative efficiency of a reflector and of portrait lenses for the delineation of celestial objects (*Monthly Notices*, vol. lvi. p. 372). It has often been asserted that portrait lenses have, by reason of their short focal lengths in relation to their apertures, greater photographic power than instruments of other forms; but this does not accord with Dr. Roberts's experience. A portrait lens of Dallmeyer's latest pattern, 3½ inches aperture and 9½ inches focus, and a 5-inch Cooke patent triplet lens of 19.2 inches focus, were attached with their cameras to the 20-inch reflector, and photographs of the same regions were taken simultaneously with the three instruments. The 5-inch lens was stopped down to a ratio of 1 to 4.8, while the ratio of aperture to focus in the case of the reflector was 1 to 4.9. In three exposures on the region of M. 33 Trianguli, the stars were 3½ times more numerous on the reflector photograph than on the photograph taken with the 5-inch lens in an equal angular area, and 7.8 times more numerous than in the case of the 3½-inch lens. At the same time the reflector photograph showed the nebula more extensively, more clearly depicted, at least two stellar magnitudes denser, and with far more structural details than can be seen on the other photographs.

Similar results were obtained with exposures on other regions, and in all cases the nebulosity shown on the plates taken with the reflector was denser than that registered by the portrait lenses in the approximate ratio of the relative numbers of faint stars shown on plates exposed simultaneously. Figures are also given which demonstrate the superiority of the reflector over the Willard lens, with which Prof. Barnard has obtained such striking photographs.

The experiments seem to point to a practical limit of about 1 to 5 for the ratio of aperture to focus in the construction of instruments for celestial photography. Dr. Roberts further concludes that it is not possible, as is often stated, that a photographic instrument of the portrait lens form can imprint images of nebulae that are fainter than the faintest star-images imprinted at the same time and under exactly similar conditions.

SOLAR PHOTOGRAPHY AT MEUDON.—In his recent presidential address to the Astronomical Society of France, Dr. Janssen gave a few particulars as to the progress of solar photography at Meudon. The well-known photographs taken some years ago revealed much that was new in regard to the granulation of the photosphere, and as the work has been continued, it has been found that the faculae, and even the striae in the penumbra of a sun-spot, have a granular structure like the rest of the solar surface. One can look upon the granule, or small photospheric cloud, as an element of the photosphere just as the cell is that of organic tissues. These granular elements are very small, sometimes being only one or two-tenths of a second in diameter; and exceptionally favourable atmospheric conditions appear to be necessary for their proper investigation.

UNIVERSITY OBSERVATORIES IN AMERICA.—We learn from *Science* that at the last session of the Illinois Legislature an appropriation was made for the erection and equipment of an observatory for the State University at Champaign. The designs for the building were made, under direction of Prof. Ira O. Baker, by the Architectural Department of the University. The instrumental equipment, consisting of a 12-inch equatorial, a 3-inch combined transit and zenith telescope and a chronograph, will be made by Warner and Swasey, the optical parts being made by Brashear. This makes four universities which have established observatories within the past year, all of which have ordered telescopes from Warner and Swasey, with optical parts by Brashear. The list is as follows: University of Pennsylvania, Philadelphia (18-inch aperture); University of Ohio, Columbus (12-inch aperture); University of Minnesota, Minneapolis (10½-inch aperture); University of Illinois, Champaign (12-inch aperture).

INTERNATIONAL CATALOGUE OF SCIENCE.

WE have been requested to print the following circular, which the Royal Society has recently issued to the foreign and other delegates of various nations, now numbering about thirty, whose appointment has been already notified:—

"In anticipation of the forthcoming International Conference to consider the preparation of a catalogue of scientific literature by international co-operation, we are directed to address to you the following:—

"It is proposed that the Conference shall be held at the rooms of the Royal Society, Burlington House, London, *beginning on Tuesday, July 14, 1896, at 11 a.m.*

"One of the earliest acts of this first meeting will be to appoint an organising committee to determine the mode of procedure (including the language or languages to be used at the Conference), the course of business, and the way in which votes shall be recorded on occasions when it will be necessary to have recourse to formal voting.

"The Committee of the Royal Society hopes to be in a position to bring definite proposals before the Conference with regard to its main work. Meanwhile, we are directed to submit to your consideration the following provisional suggestions, and to invite remarks from you upon them:—

"I. That the proposed International Authors and Subject Catalogue of Scientific Literature shall be restricted, in the first instance, to branches of pure science, such as mathematics, astronomy, physics, chemistry, geology, zoology, botany, physiology, and anthropology, to the exclusion of applied sciences, such as engineering, medicine, and the like: the determination of the distinction between pure and applied science being left to the Conference.

"II. That in such an International Catalogue of Science all definite contributions to pure science shall be thoroughly indexed, whether occurring in books, memoirs, &c., treating of pure science, or in those devoted to applied or practical science—in other words, that the catalogue shall not be confined to papers published in certain periodicals, or to books of a certain category.

"III. That with regard to the form of the said Catalogue:—

"(a) There shall be a first issue of authors' titles, subject-matter, &c., in the form of *slips or cards*, which shall be distributed as speedily and as frequently as possible to subscribers generally.

"(b) That a further issue in book form, in a state for use as a permanent work of reference, shall take place at such intervals as may be determined on, parts corresponding to the several sciences being, if found desirable, published separately.

"IV. That, in order to secure the preparation and publication of such an International Catalogue, a Central Bureau shall be established under the control of an International Council.

"V. That the whole of the Catalogue shall be prepared and issued subject to the authority of the International Council, and that any particular undertakings which may be allotted to particular countries, institutions, or persons, shall be subsidiary to the work of the Central Bureau and subject to its control.

"VI. That the cost of preparing and publishing the said Slip- and Book-Catalogues at the Central Bureau during the years 1900–1904, in so far as these are not met by sales, shall be provided for by means of a guarantee fund, and that application be made to governments, learned societies, institutions, and individuals throughout the world, to assist in establishing such a fund.

"The Conference will also have to take into consideration the following matters, among others:—

"(a) Supposing that the plan of a Central Bureau is adopted, where shall the Bureau be placed?

"(b) The mode of appointment and organisation of the International Council in charge of the Bureau.

"(c) The language or languages to be adopted for the Catalogue.

"(d) The system of classification to be adopted in the subject index. It is suggested that the decimal system of Dewey may be so amended as to be worthy of adoption.

"There is necessarily the greatest difficulty in estimating the cost of the work in advance, or in forming an opinion as to the extent to which such an enterprise will be self-supporting. It will probably, therefore, be best to raise a guarantee fund covering a period of not less than five years, within which period it will undoubtedly be possible to determine the cost of the enterprise. The annual sum to be thus secured may be approximately estimated at ten thousand pounds.

"We are, your obedient servants,

"M. FOSTER, Secretary, R.S.

"RAYLEIGH, Secretary, R.S.

"E. FRANKLAND, Foreign Secretary, R.S."

THE FRENCH UNIVERSITIES.¹

ON March 5 the Chamber of Deputies voted unanimously for a reconstitution of the French universities. In order to understand the object of this important law, it is necessary to recall the circumstances and the legislative proceedings which brought about its adoption.

Until 1875 the faculties of literature, science, law, and medicine existed separately in France, without being united by a single tie, even when four of them (a university, in the acknowledged sense of the word) existed in the same town. In 1875 the National Assembly announced the liberty of higher instruction, permitted the installation of free faculties, and accorded to the group of three faculties (refused to similar groups of the faculties of the State) the title of University. This vote increased at once, by reaction, the force of the movement, which, since the fall of the Empire, claimed unsuccessfully, by means of such men as Guizot, Cousin, Duruy, and Renan, the constitution of State universities. In 1877 a first scheme of law was handed over to M. Waddington, then Minister of Public Instruction, by a Committee of eminent men

¹ Condensed from an article in the *Revue de l'Université de Bruxelles*, February 1896.