

MESSRS. MACMILLAN AND CO., LTD., have published a third edition of "Comparative Anatomy of Vertebrates," which has been adapted from the sixth German edition of Prof. R. Wiedersheim's work by Prof. W. N. Parker. The present edition has been almost entirely re-written, and with Prof. Wiedersheim's permission, alterations desirable in the interests of English students have been made. The general plan of the original has been retained, but some portions have been extended and others abridged. The second English edition was reviewed in the issue of NATURE of September 1, 1898 (vol. lviii., p. 409), when the characteristics of this widely known student's manual were described. The price of the new edition is 16s. net.

### OUR ASTRONOMICAL COLUMN.

#### ASTRONOMICAL OCCURRENCES IN FEBRUARY:—

- Feb. 4. 4h. 11m. Moon in conjunction with ♀ and 3° 48' S.  
 5. 6h. 22m. to 11h. 12m. Transit of Jupiter's Satellite IV. (Callisto).  
 ,, 13h. 19m. to 17h. 1m. Transit of Jupiter's Satellite III. (Ganymede).  
 10. 7h. 50m. Venus and Saturn in conjunction.  
 11. 10h. 28m. Minimum of Algol ( $\beta$  Persei).  
 ,, 12h. 22m. to 13h. 19m. Moon occults  $\zeta$  Tauri (Mag. 3).  
 13. 2h. Mercury at greatest elongation (18° 9' E.).  
 ,, 11h. 45m. to 13h. 0m. Moon occults  $\delta$  Geminorum (Mag. 3.6).  
 14. 7h. 17m. Minimum of Algol ( $\beta$  Persei).  
 15. 2h. 7m. Moon in conjunction with Jupiter and 1° 12' N.  
 ,, Illuminated portion of the disc of Venus = 0.797.  
 27. 12h. 48m. Moon in conjunction with Uranus and 0° 7' N.

PHOTOGRAPHIC OBSERVATIONS OF ENCKE'S COMET (1908a).—Encke's comet was photographed at the Heidelberg Observatory on January 13, 14, 15, 18, and 19, and in No. 4229 of the *Astronomische Nachrichten* (p. 79, January 21) Prof. Wolf records the positions and magnitudes derived from the plates. On the first three dates the recorded magnitude was 12.0, on the last two 12.5. The observed positions have been compared with those given in the ephemeris, and corrections to the latter are appended; those for R.A. are fairly constant at +3m., but those for declination vary from -24'.0 (December 25, 1907) to +1'.4 (January 19).

SATURN, A NEW RING SUSPECTED.—Observing at an elevation of 1550 metres, at the Revard, Puy-de-Dôme, France, under exceptionally favourable conditions on September 5, 1907, M. G. Fournier suspected a faint, transparent, and luminous ring exterior to the principal rings of Saturn. On September 7 the same observer confirmed the presence of a very pale luminous zone sharply defined at its edges, but neither he nor M. Jarry-Desloges, who communicates the discovery to the *Bulletin de la Société astronomique de France* (p. 36, January), was able to find it on September 11. The latter observer suggests the possibility that the ring is subject to periodical fluctuations of brightness, and may, therefore, only become visible at certain intervals; he also suggests that observers situated in high altitudes, such as the Arequipa and Flagstaff stations, may, alone, be able to observe this difficult detail of the Saturnian appendage. A drawing accompanying the communication shows the nebulous ring, extending beyond the principal rings, as it appeared at 22h. 25m. on September 7.

DETERMINATION OF THE MOON'S LIGHT WITH A SELENIUM PHOTOMETER.—In a recent note in these columns (p. 258, January 16) reference was made to some results obtained by Messrs. Stebbins and Brown in a determination of the brightness of moonlight with a selenium photometer (*Astrophysical Journal*, vol. xxvi., p. 326). The result was given as 0.23 candle-power, but, as there seems to be some misconception as to the meaning of this, an explanation seems desirable. American observers state quantities

of this kind in candle-metres, and thus interpreting the above result it means that the light of the full moon illuminates a white surface to the same extent as an illuminating source of 0.23 candle-power, placed at a distance of 1 metre, would illuminate it.

Owing to the colour-sensitiveness of the selenium cells being as yet unknown, this result must be accepted as purely preliminary; different cells gave results varying from 0.07 to 0.37, the mean being 0.22 candle-power, and very near to the 0.23 adopted by Müller ("Die Photometrie der Gestirne," Leipzig, 1897, p. 344) as the mean of several visual observations by different observers.

The method of observation adopted by Messrs. Stebbins and Brown was to determine at what distance from the selenium cell the standard candle would produce the same deflection as the light from the moon, and then to reduce this distance to terms of the standard candle-metre, afterwards applying the corrections for atmospheric absorption. The determinations of the variation of moonlight with the moon's phase gave consistent results for each cell, and forms the most valuable part of the work. The standard candle employed is by Max Kohl, and burns amyl acetate; the diameter of the round wick is 8 mm., and the height of the flame was regulated to 40 mm.

A USEFUL SUN AND PLANET CHART.—From the firm of Carl Zeiss we have received a copy of their chart for showing the position of the sun, or of any of the planets, at any epoch during the present year. The chart is constructed on a principle employed by Mr. R. H. Bow, of Edinburgh, and consists of two sets of curves and a star map. On the one set of curves, which is placed to the right of the star map, the declinations of the various bodies during the twelve months are shown, whilst the second set, placed directly below the star map, shows the right ascensions. To find the position of a planet on any date, the declination of the planet on that date is found on the former set of curves, and from the point thus determined a horizontal line is drawn across the star map. A vertical line is then drawn from the corresponding point on the right-ascension curve, and where these two lines intersect on the star map is the position occupied by the planet. A calendar of oppositions, quadratures, and conjunctions is also shown on the chart.

### CHICAGO MEETING OF THE AMERICAN ASSOCIATION.

THE fifty-eighth meeting of the American Association for the Advancement of Science and of its affiliated scientific societies was held at Chicago from December 30, 1907, to January 4, 1908, under the presidency of Prof. E. L. Nichols, professor of chemistry at Cornell University. The attendance was estimated at about 1400, the accurate registration of the affiliated societies having not been handed in at the time of writing. The programme was one of unusual interest, and a number of important measures were adopted.

The opening meeting of the association was held on the morning of Monday, December 30. Addresses of welcome were made by Dean G. E. Vincent, of the University of Chicago, in the enforced absence of the president, Dr. H. P. Judson, and by Mr. G. E. Adams, vice-chairman of the local committee for the meeting. The retiring president, Dr. W. H. Welch, of Johns Hopkins University, introduced the president of the meeting, Prof. Nichols, who replied to the addresses of welcome. The address of the retiring president, Dr. W. H. Welch, was given on December 30 before a large audience, and consisted of a masterly treatment of the subject of the interdependence of medicine and other sciences of nature (see NATURE, January 23). At the conclusion of the address a reception was given to the members of the association and affiliated societies.

The vice-presidential addresses, that is, addresses of presidents of sections, were distributed through the week at afternoon sessions. That before Section A (mathematics and astronomy) was delivered by the retiring vice-president, Edward Kasner, of Columbia University. Its title was "Geometry and Mechanics." The address of the retiring vice-president of Section B (physics) was given by Prof.

W. C. Sabine, of Harvard University, under the title of "The Origin of the Musical Scale." The address before Section C (chemistry) was given by Mr. Clifford Richardson, of the New York Testing Laboratories, on "A Plea for the Broader Education of the Chemical Engineer." There was no address before Section D (mechanical science and engineering). The address of the retiring vice-president of Section E (geology) was delivered by Dr. A. C. Lane, State Geologist of Michigan, at the summer meeting of the section held at Lake George. The address of the retiring vice-president of Section F, Dr. E. G. Conklin, of the University of Pennsylvania, was entitled "The Mechanism of Heredity." The retiring vice-president of Section G (botany), Dr. D. T. MacDougal, of the Carnegie Institution, Washington, D.C., discoursed on "Heredity and Environic Forces." The retiring vice-president of Section H (anthropology and psychology), Prof. A. L. Kroeber, of San Francisco, spoke on "The Anthropology of California." The address before Section K (physiology and experimental medicine) was given by retiring vice-president Simon Flexner, of the Rockefeller Institute for Medical Research, New York, on the subject "Recent Advances and Present Tendencies in Pathology." An address was given before the newly established Section L (education) by the Hon. Elmer Brown, United States Commissioner of Education, on "The Future of the Section of Education."

The character of the papers read before the different sections and the affiliated societies was of a very high order. A prominent feature of the meeting was the holding of joint sessions and symposiums on subjects of allied interest. The section on mathematics and astronomy, that on mechanical science and engineering, and the Chicago branch of the American Mathematical Society, for example, held an important joint session to consider the teaching of mathematics to engineering students, in which the present status in the United States was discussed by Prof. Edgar J. Townsend, of the University of Illinois, and in other countries by Prof. Alexander Ziwet, of the University of Michigan.

Section K held an important symposium on January 1 on the subject of immunity, in which the following papers were presented after introductory remarks by the vice-president of the section, Dr. Ludwig Hektoen, of the University of Chicago:—anaphylaxis and its relation to immunity, by Dr. M. J. Rosenau and Dr. John F. Anderson, of the United States Public Health and Marine-Hospital Service (paper read by Dr. Anderson); hyper-susceptibility and immunity, by Dr. Victor C. Vaughan, of the University of Michigan; the hæmolysins of animal toxins, by Dr. Preston Kyes; artificial immunity to glucosides, by Dr. W. W. Ford; the differentiation of homologous proteids by serum reactions, by Dr. S. P. Beebe; immunity in spirochætal infections, by Dr. F. D. Novey; immunity in Rocky Mountain spotted fever, by Dr. H. T. Ricketts and Dr. L. Gomez; virulence of pneumococci in relation to phagocytosis, by Dr. E. C. Rosenow; the mechanism of streptococcus immunity, by Dr. G. F. Ruediger; immunity in tuberculosis, by Dr. M. P. Ravenel; chemical aspects of immunity, by Dr. H. Gideon Wells.

The American Society of Naturalists, in the afternoon of January 1, held an important discussion on the topic of cooperation in biological research, in which Prof. F. P. Lillie, of the University of Chicago, Dr. W. Trelease, of the Missouri Botanical Garden, Dr. H. H. Donaldson, of the Wistar Institute, Dr. Simon Flexner, of the Rockefeller Institute, Prof. W. H. Howell, of Johns Hopkins University, and Prof. J. R. Angell, of the University of Chicago, took part.

Under the auspices of Section I an important symposium was held on the subject of federal regulation of public health. This session was held jointly with the National Legislative Conference of the American Medical Association and other interested organisations. Addresses were given by Dr. W. H. Welch, Hon. George L. Shiras, Dr. Charles A. Reed (president of the National Legislative Council of the American Medical Association), and Dr. F. F. Westbrook, of the University of Minnesota. There was also a lengthy prepared discussion by representatives of the various organisations concerned.

Section G and the Botanical Society of America held a symposium on the species question, in which the taxonomic aspect was discussed by Prof. C. E. Bessey and Dr. N. L. Britton, the physiologic aspect by Dr. J. C. Arthur and Dr. D. T. MacDougal, and the ecologic aspect by Prof. F. E. Clements and Prof. H. C. Cowles.

The American Chemical Society, as usual, held a very important meeting with a lengthy programme in joint session with section C of the American Association for the Advancement of Science.

As the result of a letter from the President of the United States, Mr. Roosevelt, to the president of the association, Dr. Nichols, concerning the necessity for active measures to conserve the natural resources of the United States, resolutions were adopted announcing the importance of such an effort, and appointing a standing committee of the association to consider plans and to forward the general movement. Resolutions were also adopted favouring an increase in the facilities given by Congress to the United States Bureau of Education. Further resolutions were passed urging the establishment of a research laboratory in tropical medicine in the Isthmian Canal zone; favouring the efforts to preserve from extinction the great sea animals of the waters adjoining the United States; and urging upon Congress the establishment of an Appalachian Forest Reserve, reiterating a recommendation urged at the last meeting of the association.

At the meeting of the general committee on the night of January 2 it was decided that the next regular meeting of the association be held in Baltimore during convocation week, 1908-9, and that a summer meeting be held in the week beginning June 29 at Dartmouth College, Hanover, N.H. A resolution was also adopted recommending that arrangements be made, if possible, for a meeting in the summer of 1910 in the Hawaiian Islands.

Officers for the present year were elected as follows:—president, Prof. T. C. Chamberlin, of the University of Chicago; vice-presidents, A, no election; B, Prof. K. E. Guthe, State University of Iowa; C, Prof. L. Kahlenburg, University of Wisconsin; D, Prof. G. F. Swain, Massachusetts Institute of Technology; E, Prof. Bailey Willis, U.S. Geological Survey; F, Prof. C. J. Herrick, University of Chicago; G, Prof. H. M. Richards, Columbia University; H, Prof. R. S. Woodworth, Columbia University; I, no election; K, Prof. W. H. Howell, Johns Hopkins University; L, Prof. G. Stanley Hall, Clark University; general secretary, Prof. F. W. McNair, president Michigan School of Mines; secretary of the council, Prof. D. C. Miller, Case School of Applied Science; treasurer, Prof. R. S. Woodward, Carnegie Institution, Washington, D.C. (as before); permanent secretary, Dr. L. O. Howard, Smithsonian Institution, Washington, D.C. (as before).

#### STRESSES IN MASONRY DAMS.

THE stresses in masonry dams, to which much attention has recently been devoted in our correspondence columns, formed the subject of three papers read before the Institution of Civil Engineers on January 21. In the first, Sir John W. Ottley, K.C.I.E., and Dr. A. W. Brightmore described some experiments, occupying about fourteen months, made with plasticine models of a dam of typical triangular section under perfect conditions. The height of the model was 30 inches, and the length of the dam 12 inches. From the results of the experiments the following conclusions were drawn:—(1) If a masonry dam be designed on the assumption that the stresses on the base are uniformly varying, and that these stresses are parallel to the resulting force acting on the base, the actual normal and shearing stresses, on both horizontal and vertical planes, would (in the absence of stresses due to such factors as changes in temperature, unequal settlement, &c.) be less than those provided for. There can be no tension on any plane at points near the outer toe. There will be tension on planes other than the horizontal plane near the inner toe, the maximum intensity of such tension being generally equal to the average intensity of shearing stress on the base, and the inclination of its plane of action being about 45°.

In the second paper Mr. J. S. Wilson and Mr. W. Gore