

in metallurgy, and began that long association with Dr. Arnold in the development of the University as a centre of metallurgical education and research. Besides the work of training chemists and managers for the steel industry of the city, the two collaborators published numerous papers containing important contributions to metallurgy, and were always ready to assist local manufacturers by advice, by conducting special investigations, and when necessary by defending their patent rights against attacks.

In 1911 Dr. McWilliam left for India to become government inspector of steels in that country, and held that responsible position for six years. He then entered the Tata Iron and Steel works and for a year did excellent service in the technical reorganisation of the steel departments. On his return to Sheffield he took up a consulting practice, for which he was peculiarly qualified from his intimate knowledge of the manufacture and properties of steels of high quality. As an active member of technical societies, he could always be counted on to illuminate a discussion by drawing on his stores of experience and by his shrewd criticism and ready wit. His good literary style is seen to advantage in the well-known work "Modern Foundry Practice," which he wrote in collaboration with Dr. Longmuir. Of fine presence and genial manner, he was a popular figure in the city of his adoption, and enjoyed the esteem and affection of his friends and colleagues, among whom were so many who owed to him a part of their metallurgical training.

WE learn from the *British Medical Journal* of the death on March 26 of Dr. W. Ainslie Hollis at the great age of eighty-two years. Dr. Hollis was educated at Cambridge and St. Bartholomew's Hospital, receiving

his M.D. in 1871. He was elected a Fellow of the Royal College of Physicians of London in 1876. Most of his life was spent at Brighton, where he set up in private practice; but his activities led him more to literary and scientific pursuits, during the course of which he made a fine collection of British macro-lepidoptera. He was president of the Brighton and Sussex Medico-Chirurgical Society and of the Brighton Natural History and Philosophical Society, and in 1913 he served as president on the occasion of the Brighton meeting of the British Medical Association. Dr. Hollis was the author of numerous contributions to medical journals on disseminated fibrosis of the kidney, the duration of life in infective endocarditis and other topics.

THE death is announced, in his sixty-third year, of Dr. Henry Edgerton Chapin, who was professor of biology in Ohio University from 1891 to 1900. He then removed to New York to teach biology and physiography in the high schools there. He was the author of many scientific monographs, and collaborated in writing Chapin and Rettger's "Elementary Zoology and Guide."

WE much regret to announce the death on April 21, in his seventy-third year, of Sir Alfred Bray Kempe, F.R.S., treasurer of the Royal Society from 1898 to 1919.

WE regret to record the death on April 19, at seventy years of age, of Sir Alfred Pearce Gould, K.C.V.O., late vice-chancellor of the University of London, and president of the Medical Society of London and of the Röntgen Society.

Current Topics and Events.

AT the meeting of the London Mathematical Society to be held on May 11, at 5 P.M., in the rooms of the Royal Astronomical Society, Burlington House, Prof. G. H. Hardy will deliver a lecture on "The Elements of the Analytic Theory of Numbers." Members of other scientific societies will be welcome.

THE Institute of Physics, of which Sir J. J. Thomson is president, is arranging for the delivery of a course of public lectures with the view of indicating the growing importance and place which physics now holds in industry and manufacture. The first of these lectures was delivered by Prof. A. Barr of Glasgow, on Wednesday, April 26, in the Hall of the Institution of Civil Engineers.

RAI BAHADUR SARAT CHANDRA ROY is carrying on with a considerable measure of success his new quarterly journal of anthropology, entitled *Man in India*. The third number contains two important articles by Mr. T. C. Hodson, the author of works on the Nagas and other Assamese tribes, on exogamy in India and free marriage, which merit the attention of anthropologists, besides shorter notes on the Kharwars and Khasis and on Indian palæoliths. The journal, which is published at Church Road, Ranchi, deserves encouragement.

A JOHN SCOTT medal and certificate, with a premium of 160l., has been awarded by the Board of Directors of City Trusts, United States of America, to each of the following: Dr. William Duane, for "his researches in radio-activity and the physics of radium and of X-rays"; Prof. R. A. Fessenden, for "his invention of a reception scheme for continuous wave telegraphy and telephony"; Mr. Elwood Haynes, for "his discoveries in connection with stainless steel, stellite, chrome-iron, etc."; and Dr. T. B. Osborne, for "his researches on the constitution of the vegetable proteins."

THE annual meeting of the Iron and Steel Institute will be held on May 4-5 at the house of the Institution of Civil Engineers. On the first day of the meeting, the new president, Mr. Francis Samuelson, will deliver his presidential address, and the Bessemer Medal will be presented to Prof. Kotaro Honda. The remainder of the meeting will be devoted to the discussion of some thirteen papers by various workers on the constitution, properties, and manufacture of iron and steel. The annual dinner of the Institute will be held on May 4 at 7.30 P.M. at the Connaught Rooms, Great Queen Street, W.C., and the autumn meeting will be held in London on September 5-7 next.

MR. JOHN PLACE, 16 The Avenue, Beckenham, Kent, directs our attention to a phenomenon known to the guides at the Solfatara of Pozzuoli near Naples, but not, as he believes, satisfactorily explained. When a lighted torch of brushwood or tarred string is introduced into, or merely waved near any of the crevices from which gases emanate, the emanation appears to be greatly increased and "smoke and steam issue from the spot where the torch is waved," and even from fissures at a considerable distance. We suggest that the burning of the torch provides nuclei for condensation of vapour; for clouds gathering in a volcanic crater have been traced, in some cases at least, to atmospheric vapour influenced by the fine ejecta from the vent.

THE issue of the index numbers of the physics and electrical engineering sections of *Science Abstracts* completes volume 24 of each. The physics section extends to more than 900 pages, 800 of which are occupied by 2000 abstracts, while the electrical engineering section of 650 pages devotes 600 pages to nearly 1200 abstracts. Both volumes are rather larger than pre-war issues, while the number of abstracts is approximately the same. The increase of length of the abstracts is scarcely justified by any increase in the intrinsic importance of the matter abstracted. The greater average length of the electrical engineering as compared with the physics abstracts is due mainly to the number of descriptions of power plants and installations. *Science Abstracts* continues to be one of the most valuable and time-saving publications issued in this country; without it, research in physics and electrical engineering would be seriously hampered and progress retarded.

THE issue of *Science* of March 31 contains an account of the opening of the Norman Bridge Physics Laboratory of the Californian Institute of Technology at Pasadena, South California. The laboratory and equipment have been provided by Dr. Norman Bridge with the object of furthering work of the highest type in the mathematical and physical sciences and their applications. In the opinion of Dr. Millikan no subject furnishes a better training in accurate observation, honest and dispassionate treatment of data, and logical deduction of consequences, while the classics are gradually disappearing as the foundation of the American educational system. The physics laboratory, of which Prof. Millikan has been appointed director, and the Gates Chemical Laboratory with Dr. Noyes as director, are to receive 7000*l.* per annum for five years from the Carnegie Corporation, and will thus be able to co-operate with the Mount Wilson Observatory in a joint investigation of the constitution of matter and the nature of radiation.

In a paper read at a recent meeting of the Royal Colonial Institute, Mr. J. M'Whae, Agent-General for Victoria, dwelt on the importance of white settlement of the "heart of Australia," an area of over half a million square miles lying approximately within a circle of 400 miles radius, the circumference of which passes through Sydney, Melbourne, and

Adelaide. This area at present contains only 3,300,000 inhabitants, although it comprises as great an area as France, Germany, Denmark, Switzerland, Holland, and Belgium together. He admitted, however, that the problem is not merely one of attracting population but depends also on the provision of a sufficiency of water. Artesian wells number over 5000, and there are in addition many shallow bores in the Riverina. In Victoria to-day 14,000,000 acres out of 56,000,000 acres are being artificially irrigated. The Murray river valley offers the greatest opportunities and considerable areas of arid land have been reclaimed. The greater part of the "heart of Australia" must, however, depend on artesian water, and to what extent this supply is inexhaustible remains to be seen.

THE annual report of the Smithsonian Institution of Washington for 1919 is a volume of nearly six hundred pages, of which the greater part is composed, as is customary, of noteworthy contributions to science which were made known during that year. In all, twenty-eight such publications are included. Sir Ernest Rutherford's article, "Radium and the Electron," which appeared in the Jubilee issue of *NATURE* of November 6, 1919, and Sir Arthur Keith's presidential address at the Bournemouth meeting to Section H (Anthropology) of the British Association on "The Differentiation of Mankind into Racial Types," from *NATURE* of November 13, 1919, are reprinted. There are also two translations, "On the Extinction of the Mammoth," by H. Neuville, which is taken from *L'Anthropologie* of July 1919, and "A Great Chemist: Sir William Ramsay," by Ch. Moureu, from *Revue Scientifique* of October 1919. Some of the remaining papers are reprinted from American journals and a few are original. The volume forms a valuable record of notable announcements in the world of science for the year 1919.

WE have received from Messrs. Harbutt's Plasticine, Ltd., of Bathampton, an inexpensive outfit for mounting insects and other natural history objects. The apparatus is very simple and consists of "thymo-plas," which is plasticine impregnated with a strong preservative, slides of celluloid, and binding strips of gummed paper. In using this method, a narrow strip of "thymo-plas" is used to form a cell of the desired shape on the centre of a celluloid slide: the object to be mounted is then transferred to the cavity thus formed and a second slide of celluloid is pressed down on top. The opposite ends of the two superposed slides are securely bound together with strips of gummed paper, and the mount is then complete. The paper strips also serve as labels upon which the necessary data relating to the specimen may be recorded. Any one who tries this method will find no difficulty in carrying it out; groups of insect eggs *in situ* on leaves or twigs, coccids, larval tubes, cocoons, pupæ, etc., can all be well exhibited when mounted in this way. The method can also be applied to samples of seeds, fibres, small shells, and many other objects. In so far as adult insects are con-

cerned the specimens are not so well displayed as when pinned and set, but, on the other hand, they are secure against damage, and the "thymo-plas" method should be valuable for teaching purposes when specimens must of necessity be handled frequently. Collections mounted in this manner can be stored in microscope slide cabinets with undivided trays. By way of advertisement it is stated that "thymo-plas" is "adopted by Prof. Lefroy as the standard method for use in the Entomological Department, Royal College of Science, London." The price of the outfit is 3s. and 6s. according to size.

Two catalogues of second-hand works of science, each of exceptional interest, have recently reached us, namely, Sotheran's Catalogue of Science and Technology, No. 3, and Heffer's Catalogue (No. 210) of Scientific Books and Publications of Learned Societies. In the former list many works from the libraries of the late Profs. Carey Foster, J. Perry, and P. Duhem are offered for sale. In the latter a prominent feature is sets of scientific journals. The catalogues are obtainable free of charge from their respective publishers—H. Sotheran and Co., 140 Strand, W.C.2, and W. Heffer and Sons, Ltd., Cambridge.

Our Astronomical Column.

THE APRIL METEORS, 1922.—Mr. W. F. Denning writes that what appears to have been the most brilliant and abundant shower of Lyrids observed during the present century was witnessed by Miss A. Grace Cook and Mr. J. P. M. Prentice, of Stowmarket, on the night following April 21. Miss Cook, watching the sky up to 13 hours G.M.T., observed 30 Lyrids, and a number of others must have escaped observation while the paths of the brighter meteors were being recorded. Eight of the meteors seen were brilliant, six of them being estimated as equivalent to, or surpassing, the lustre of Jupiter. The maximum of the display apparently occurred in the two hours preceding midnight; the meteors moved swiftly, leaving trails. The brightest object appeared at 11 h. 12 m. G.M.T., and it left a conspicuous streak which remained visible for twenty seconds. Mr. Prentice also watched the progress of the shower, and saw many brilliant meteors, though the sky was partly clouded at times.

At Bristol the sky was overcast during the whole night, and no meteors could be seen.

ECCENTRICITY OF DOUBLE-STAR ORBITS.—Prof. H. N. Russell shows (*Pop. Ast.*, March) that it is possible to deduce average eccentricities, by statistical methods, even in the case of those long-period systems in which only a very small portion of the orbit has been described. All that is necessary is to note the angle between the tangent and the radius-vector, and compare the observed distribution of angles with that resulting from different assumed values of eccentricity. From observations of 750 pairs he deduces a mean eccentricity slightly greater than 0.6, about the same as that given by stars the orbits of which have been determined. This is an important result from the cosmogonic point of view, as the orbits now considered must be very large, and the periods measured by millenniums.

PROGRESSIVE LATITUDE CHANGES.—The reported change of the latitude of the International Station at Ukiah, California, at the rate of a foot a year, recently attracted considerable notice. Prof. F. Schlesinger devotes an article to the subject in *Astr. Journ.*, 798. He notes that Cohn's proper motions (depending on the Auwers system) are used for the latitude stars at the International stations, and that they differ systematically from those of Boss. The following list shows the apparent annual change of latitude of the six stations—(1) using Cohn's system and (2) using Boss's: Mizusawa, Long. -141° (1), $+0.0008''$ (2), $-0.0079''$; Tschardjui, Long. -63° (1), $+0.0110''$ (2), $+0.0023''$; Carloforte, Long. -8° (1), $+0.0053''$ (2), $-0.0034''$; Gaithersburg, Long. $+77^{\circ}$ (1), $+0.0103''$ (2), $+0.0016''$; Cincinnati, Long. $+84^{\circ}$ (1), $+0.0099''$ (2), $+0.0012''$; Ukiah, Long. $+123^{\circ}$ (1), $+0.0106''$ (2), $+0.0019''$. It will be seen that the

systematic northward shift resulting from Cohn's values vanishes when Boss's are used. If we ascribe the changes to a motion of the pole, the indicated motion is 5 inches per annum towards North America. We may, however, consider that at Mizusawa, which is in a volcanic region, there is an actual surface shift of 10 inches per annum southward; the shifts at the other stations are small enough to be regarded as accidental. Prof. Schlesinger urges that observations at the second, fourth, and fifth stations, which were dropped during the war, should be resumed, at least temporarily.

EFFECTIVE TEMPERATURES OF STARS.—Various methods used to obtain stellar temperatures give different results, yet it is interesting to note that the divergences are not great; indeed, for stars of classes G, K, and M, stars of comparatively low temperature, the agreement is fairly close. The cause of these disagreements lies probably in the fact that each observer has limited himself to a portion of the spectrum only, which may not necessarily contain the observed maximum spectral energy. Dr. W. W. Coblentz, in the Proceedings of the National Academy of Sciences (U.S.A.) (vol. 8, No. 3, p. 49), gives the results of his inquiry into the effective temperatures of 16 stars as estimated from the energy distribution in the complete spectrum.

By means of screens of red and yellow glass, quartz, and water he found it possible to obtain the radiation intensity in the spectrum in consecutive portions from 0.3μ to 10μ . In addition to an interesting table giving a comparison of the total radiation from stars having closely the same visual magnitude but of very different spectral class, Dr. Coblentz sums up his results in another table, comparing his stellar temperatures with values previously obtained by other workers. As the values he has deduced will prove very useful for reference they are here reproduced, commencing with the hottest stars and passing through the various stellar types, taking class G₀ as standard.

Star.	Spectrum Type.	Temp.
ϵ Orionis	B ₀	13,000° K
β Orionis	B ₈ p	10,000
α Lyrae	A ₀	8,000
α Can. Maj.	A ₀	8,000
α Cygni	A ₂	9,000
α Aquilae	A ₅	8,000
α Can. Min.	F ₅	6,000
α Aurigae	G ₀	6,000
α Bootis	K ₀	4,000
β Geminorum	K ₀	5,500
α Tauri	K ₅	3,500
α Orionis	Ma	3,000
α Scorpii	Ma p	3,000
β Androm.	Ma	4,000
μ Geminorum	Ma	3,500
β Pegasi	Mb	3,000