

Perhaps Dr. Sharp's greatest service to zoology was in connexion with the "Zoological Record." Of this he became general editor in 1892, and he only laid the work down a few weeks before his death. Throughout this period he was also recorder of all the literature on insects. He improved the volumes immensely, and raised the classified subject-index to a wonderful degree of efficiency.

So far allusion has been made only to his writings, but he also excelled as a field-worker and collector. Ever laying great stress on the importance of the collection and permanent preservation of material, he published several articles on these points. His collection of British Coleoptera is as fine as any, and he also made a very large foreign beetle collection, the greater part of which, consisting of some 150,000 specimens, was acquired by the British Museum in 1905. During his time at Cambridge he amassed a large amount of material for that Museum. His fine library was recently purchased by the Cawthron Institute at Nelson, New Zealand.

Dr. Sharp was a wide reader, and though of rather slight bodily frame he had, even to an advanced age, great powers of endurance as a field-worker, and an almost unlimited capacity for mental work. No time was ever lost in picking up the threads of his work, so that even short intervals were used to the full. He was Hon. M.A. of Cambridge; elected F.R.S. in 1890; fellow, and former councillor of the Zoological Society. He joined the Entomological Society in 1862 and was president in 1887 and 1888, besides holding lesser offices on several occasions. He was also an honorary or corresponding member of the New Zealand Institute and of the principal entomological societies of the world.

H. S.

DR. WILLIAM KELLNER.

DR. WILLIAM KELLNER, who died at Charlton, on September 12, in his eighty-third year, was born at Frankfort in 1839, and received his scientific training under Prof. Wöhler at Göttingen, finally obtaining his Ph.D. degree in that university. He became a Fellow of the Institute of Chemistry in 1878 and served on the Council from 1895 to 1898. In 1862 he came to England as assistant to Sir Henry Roscoe, at Owens College, Manchester, whence, in 1864, he went to

Woolwich and joined the staff of the War Department chemist (Sir Frederick Abel). In his early years at Woolwich Dr. Kellner was engaged in the varied general work of the chemical department. Later his main work became investigatory and experimental, both in connexion with explosives, as also to meet the requirements of the various Commissions and Committees on which the War Department chemist was a prominent member; of these the "Royal Commission on Accidents in Mines" and "The Explosives Committee" (appointed in 1889 to produce a smokeless powder for the Service) may be mentioned.

Dr. Kellner also devoted much work to the production of an apparatus for determination of the flashing point in oils, and was largely responsible for the Abel flash point apparatus, eventually perfected; in collaboration with Sir Boverton Redwood he carried out an exhaustive series of tests with this apparatus.

As a scientific worker Dr. Kellner was painstaking and methodical, displaying much skill^r in devising experiments to assist in elucidating the various problems confronting him in the course of his work. As regards practical results his most important work was in connexion with the evolution of cordite, much of the more difficult research and experimental work leading to the production of this explosive being carried out by him in the chemical department at Woolwich Arsenal; in spite of the numerous smokeless powders which have been brought into use since, the fact that, after a period of thirty years, cordite still remains the British Service propellant for army and navy use, is perhaps the best testimonial to the thoroughness of his work in this direction.

In 1892 Dr. Kellner succeeded Sir Frederick Abel as chemist to the War Department, and in addition to the duties of this office, served as an associate member of the Ordnance Board and as consulting chemist to the Royal Gunpowder Factory at Waltham Abbey; he retired from the service in 1904.

WE much regret to announce the death on October 2, at fifty-eight years of age, of Col. E. H. Grove-Hills, F.R.S., formerly head of the Topographical Department of the War Office and the author of a number of papers on astronomical subjects.

Current Topics and Events.

H.R.H. THE PRINCE OF WALES has graciously accepted an invitation to be present at a joint dinner of the Institution of Mining Engineers (representing coal-mining engineering) and the Institution of Mining and Metallurgy (representing the mining of minerals other than coal) to be held on Thursday, November 16. The dinner will be held at the Guildhall by permission of the Corporation of the City of London.

IN his presidential address to the British Association at Edinburgh last year, Sir Edward Thorpe referred to the difficulty which is encountered by many workers in science of being unable to obtain all the scientific books they require owing to lack of

means. Sir Robert Hadfield has now generously offered to contribute a sum of 50*l.* per annum for three years, to be expended in supplies of books to those who are engaged in scientific pursuits and are unable to purchase for themselves. The council of the British Association has at present under consideration the best means of allocating this gift.

AMONG many important accessions of manuscripts to the Library of Congress (Washington) noted in the librarian's report for 1921, we observe the papers and correspondence of the late Major-General W. C. Gorgas, and the diaries and note-books of Jean Nicholas Nicolle, the explorer of the upper Mississippi, Missouri, Red, and Arkansas rivers in the first

half of the nineteenth century. The division of maps has received many rarities. An increase of receipts from the Central Powers is noted. "A large number of these were theses of German universities and institutes of technology, which goes to show that the work of these institutions was carried on during the war without interruption."

ACCORDING to letters received by the last mail, the International Congress of Americanists at Rio de Janeiro has been a very great success. An enormous mass of papers was presented, all of which the Government proposes to print in full. At the close of the meeting the majority of the members took advantage of the delightful excursions which had been arranged for their benefit. After some discussion it was decided to hold the twenty-first session of the congress in 1924 in Holland by invitation of the Dutch Government, and in 1925 at Gothenburg, Sweden, by invitation of that town, where the museum is in charge of Mr. Erland Nordenskiöld, the well-known authority on South America. In 1926 the congress will meet in Philadelphia.

THERE are welcome indications that the work of investigating our national antiquities, interrupted by the outbreak of the war, is now being revived. The Congress of Archæological Societies, in union with the Society of Antiquaries, London, has just issued the first number, for 1921, of "The Year's Work in Archæology." This useful publication gives lists, arranged in the three kingdoms and their counties, of the progress of exploration. In a valuable supplement we have a list of the more important papers on the subject published by the local societies, and though a large number of these societies are affiliated to the Congress, there is still room for the association of local workers in this important enterprise. The Congress makes an appeal for contributions in order to effect the purchase of Cissbury Ring, near Worthing. As this pamphlet shows, there are still considerable vandalism and destruction of important monuments; the Congress protests specially against the destruction of a portion of the Middlesex Grim's Dyke at Pinner Green, and other examples are quoted in the Report. Much important work is being done in connexion with the Archæological Survey, and the president, Sir Hercules Read, remarks that there are many signs that we are at last becoming a civilised nation, as is shown by the Ancient Monuments Act and the appointment of the Congress Secretary, Mr. Crawford, to the newly created post of Archæology Officer at the Ordnance Survey.

THE *Toronto Star* of July 6 last has a note on a method of marking trails leading to springs of water which is practised by Indians of Western Texas. Two heaps of rock roughly heaped together, one about three feet high, the second a little lower, are placed beside the track, usually on an elevation commanding a view of the country for some five miles or more. A sight is taken from behind the larger heap, over the smaller, to some object on the horizon, such as a tree or clump of

bushes. Near this object will be found a second pair of heaps of rock sighting on a second objective. This process is continued until the spring is reached. This primitive method of sighting a trail is of interest in connexion with the suggestions put forward by Mr. Alfred Watkins in his "Ancient British Trackways," recently noticed in these columns. He argued that many of the older roads in this country could be assigned to pre-Roman times on the evidence of what it was presumed were sighting marks, which must have been used in much the same way as the Indians are said to make use of these heaps of rocks. Mr. Watkins's theory, as was pointed out when it was under notice, undoubtedly holds good in many cases, especially in connexion with natural objects; in others, particularly in the case of mounds, moats, churches, etc., it appears more open to criticism.

THE Fifth Annual Report of the Imperial War Museum has recently been issued by H.M. Stationery Office, price 9d. (post free 10½d.). It is typewritten on 8 folio pages and reproduced by a multicopier. This at any rate shows a desire for economy, calculated to appease the public. The work of the museum during the year 1921-22 consisted in a complete survey of the whole collection, elimination of items of no technical value or historical interest, and the compression and concentration of the more valuable exhibits under definite headings and groupings. This was particularly the case with the Munitions and Air Force exhibits. Stress is laid in this report on the technical value of the collections and on the fact that many objects of our everyday life during the War have been preserved in this museum while they have disappeared elsewhere. Allusion is made to the proposal to utilise two galleries at present occupied by the Science Museum and certain galleries now occupied by the Imperial Institute. These proposals have, it will be remembered, evoked a great deal of opposition. The committee appointed to investigate on them has reported to the Cabinet, but no decision has yet been reached.

DR. DAVID STARR JORDAN proposes that the International Commission on Zoological Nomenclature should reject the following works from consideration under the Law of Priority:—Gronow, 1763, "Museum Ichthyologicum"; Commerson (as footnotes in Lacépède, "Hist. nat. des poissons," mostly 1803); "Gesellschaft Schauplatz," 1775-1781, an anonymous dictionary accepting the pre-Linnaean genera of Klein; Catesby, 1771, "Natural History of Carolina, Florida, and the Bahamas" (1731-1750), revised reprint by Edwards; Browne, 1789, revised reprint of "Civil and Natural History of Jamaica"; Valmont de Bomare, 1768-1775, "Dict. raisonnée universelle d'hist. nat." (several names accidentally binomial). By this all systematic names published as new in those works will be rejected as of the dates in question, but will remain available as of the dates when they were adopted by later authors of unquestioned status. It is hoped that the proposed action will extricate zoologists from an impasse into which they have been led by a divergence of views respecting the terms

"binary" and "binomial." Zoologists who may have opinions on this proposal, which they desire to lay before the Commission, are invited to communicate them in writing to any member of it, so that they may reach the Secretary at Washington, D.C., U.S.A., before September 1, 1923. They would do well first to consult Opinions Nos. 13, 20, 21, 23, and 24 issued by the Commission.

THOSE who are familiar with the history of the elements will know, and those who are not familiar can easily inform themselves of the fact, that Lavoisier included among the elements both light and heat, which he classified along with oxygen, nitrogen, and hydrogen. A more detailed study of his "*Traité élémentaire de chimie*" will show that before discussing the compounds of oxygen, nitrogen, etc., with other elements, he devoted a brief chapter to observations on the compounds of light and heat with different substances. The rapid development of chemistry soon led to the abandonment of these imponderable elements, which came to be regarded as different manifestations of energy. It is, therefore, of interest to read in the *Pharmaceutical Journal* of August 12 a letter in which Mr. Carol A. Cofman Nicoresti, B. ès Sc. et Lettr., announces, as a final conclusion of his investigation of gaseous volume and pressure, "that heat and light are both material substances, that they enter into chemical combination with other elements, and that they are *thrown out* by *chemical reaction*." It is perhaps a compliment to Lavoisier that even his untenable hypotheses should thus undergo resurrection; but that they should be put forward as original can only be taken as a sign of imperfect chemical education. In one other respect Mr. Nicoresti's growth as a student of chemistry appears to have been arrested at a period more than a century earlier than Lavoisier, since he asserts that after careful consideration he is driven to the conclusion "that there are no such things as *gases*, but that there is only *one* gas in nature. That explains why the gaseous laws are so *uniform*." In this respect he apparently adopts the views of Boyle and Mayow, and his chemical education appears to have been carried forward but little further than the period of Agricola, who "hinted that the gases in mines were manifestations of malignant imps."

IN the will of Prince Albert of Monaco, who died on June 26 last, there are noteworthy gifts for scientific purposes. His farm at Sainte Suzanne is left to the French Academy of Agriculture, and the wish is expressed that the estate should remain a place for agricultural experiments, to demonstrate what science and determination can obtain from sterile lands. Dr. Jules Richard will receive 600,000 francs to enable him to complete literary and scientific works in progress, including the results of the oceanographic cruises and the preparation of the Bathymetric Chart of the Oceans. The proceeds of the sale of the yacht *Hirondelle*, all books and publications of a scientific nature, as well as certain personal effects, will go to the Oceanographic Institute at Paris and Monaco, while the Institute of Human

Palæontology in Paris is to receive any personal effects relating to the work carried on there. The Paris Academy of Sciences will receive a million francs, the income of which is to provide a prize to be awarded every two years, the nature of the prize to be indicated by the Academy, according to the needs of the moment; a like sum is bequeathed to the Academy of Medicine for a similar prize.

WE learn from the *British Medical Journal* that the Carnegie Hero Fund trustees have awarded a medallion and an annuity of 130*l.* to Dr. John Spence of Edinburgh, in recognition of his valuable and heroic work in radiology. Dr. Spence was among the first in Scotland to take up research in X-rays and medical electricity, and as a result of radiological experiments he sustained serious damage to both hands, necessitating amputation of the right forearm. Dr. Spence is still carrying on his work as radiologist at Leith Hospital and Craighleith Hospital, Edinburgh.

H.R.H. THE DUKE OF CONNAUGHT has consented to unveil the roll of honour which has been erected at the Institution of Civil Engineers to the memory of its members and students who lost their lives in the war. The ceremony will take place at 4 P.M. on Friday, October 27.

AT the next ordinary scientific meeting of the Chemical Society on October 19, Prof. T. M. Lowry will read a paper entitled "The Polarity of Double Bonds. An Extension of the Theories of Lapworth and Robinson," and it is hoped that a general discussion will take place. On Thursday, October 26, at 8 P.M., a lecture entitled "The Significance of Crystal Structure" will be delivered by Sir William H. Bragg, in conjunction with Prof. W. L. Bragg. This meeting will be held in the lecture hall of the Institution of Mechanical Engineers, Storey's Gate, S.W.1.

WEATHER reports from Captain Amundsen's arctic expedition will be sent from the ship *Maud* and included in the collective message broadcasted by wireless from the Eiffel Tower daily at 11 h. 30 m. G.M.T. These observations, according to the *Meteorological Magazine*, will commence on October 15.

It was announced at a meeting of the Chemical Society on October 5 that Prof. J. F. Thorpe had been nominated to fill, until the next Annual General Meeting, the office of treasurer, rendered vacant by the resignation of Dr. M. O. Forster, recently appointed Director of the Indian Institute of Science at Bangalore. Dr. J. T. Hewitt was nominated to fill the vacancy in the list of vice-presidents caused by Prof. Thorpe's appointment.

FROM the Report of the Castle Museum Committee to the Town Council of Norwich for 1921, just received, we learn that the Norwich Education Committee has appointed a special demonstrator to conduct round the museum organised parties of about 25 pupils accompanied by teachers. During the year 19,801 attendances were recorded, each class attending the complete series of demonstrations in sixteen weekly

visits. The first lecture dealt with the purpose and methods of a museum, the next thirteen with various forms of animal life, the fifteenth with the early history of man, and the last with the story of the rocks and fossils. We understand that other Education Committees think of following this excellent example.

MR. H. E. STONE, of Sidcup, Kent, has forwarded to us a photograph of a specimen of *Datura Stramonium* which has attained a height of 28 inches with a foliage span of 58×24 inches, and bears 25 well-developed seed-pods. The plant is undoubtedly a fine specimen, although not unusually large. The largest plants are often found on rubbish-heaps made up of garden refuse, and also as weeds in cultivated ground. Such plants benefit by their isolation as much as by rich food material. Cultivated plants are often allowed to stand too close together to be

able to develop to their full extent, while they usually lack the rich food material available in the case of isolated plants, and particularly those that have sprung up as weeds.

THE London agency of the Smithsonian Institution, Washington, which, since 1871, has been carried on by Messrs. William Wesley and Son, 28 Essex Street, Strand, London, has been removed to the premises of the new firm of Messrs. Wheldon and Wesley, Ltd. (incorporating William Wesley and Son), at 2, 3, and 4 Arthur Street, New Oxford Street, W.C.2. The large number of societies, museums, and institutions which forward their publications for transmission to their American correspondents through the International Exchange System of the Smithsonian Institution are requested to forward their consignments in the future to 2, 3, 4 Arthur Street, New Oxford Street, W.C.2.

Our Astronomical Column.

THE SUNSPOT PERIODICITY.—Many attempts have been made to correlate the 11 year period of spot variation with the 11.86 year period of Jupiter's revolution. The latter, as it stands, differs too widely, and it is necessary to combine it with some other period. Prof. T. J. J. See, in a special number of *Astr. Nachr.*, vol. 216, attempts to combine it with 9.93 years, which is the period in which Jupiter gains a semi-revolution upon Saturn. He weights these two periods in the ratio 1.828 to 1, this ratio being the square root of that of Jupiter's mass to Saturn's mass. The result is 11.18 years, which is close to the sunspot period. But it is to be noted that while the 11.86 year period depends wholly on Jupiter, that of 9.93 years depends on both planets, so that the appropriateness of the above ratio is far from clear; apart from this the resulting period of two wave motions does not depend on the ratio of their amplitudes, but on the time that one takes to gain a revolution on the other. For example, the period from spring tides to spring tides is a semi-lunation, and this would not be altered by an alteration in the relative heights of solar and lunar tides.

It will be remembered that Prof. E. W. Brown also endeavoured to get the sunspot period from Jupiter and Saturn, though in a different manner. He was successful in predicting that the 1907 maximum would be a late one. Mr. E. W. Maunder directed attention to the cyclical shift of the spots in solar latitude synchronously with the variation in activity, which seems to indicate an internal rather than an external origin.

FLAMSTEED'S LETTERS TO RICHARD TOWNELEY.—This very interesting packet of letters was recently found at the Royal Society. Dr. Dreyer contributes a long article to the *Observatory* for September describing their principal contents. A few points may be mentioned here. Flamsteed was prompt in accepting Roemer's explanation of the annual inequality of Jupiter's satellites, due to the finite velocity of light. He studied refraction at low altitudes by measuring the change in the apparent vertical diameter of the sun.

We find from his notes on the great comet of 1680 that he was at that time still a believer in the vortices of Descartes, though he makes a note on Newton's different opinion. By 1686 Flamsteed had apparently become convinced of the overthrow of the system

of vortices; after alluding to the progress in the printing of the "Principia" he expresses his satisfaction in the immense gain that the new system will afford in the study of the planetary motions, "so that in the room of mourning I congratulate my own happiness."

It is rather melancholy to note how his opinion of Halley gradually changed from admiration to jealousy and suspicion. This seems to have been largely due to the association of Halley with Hooke, whom Flamsteed considered an enemy.

We share Dr. Dreyer's hope that the letters will be published in full.

PERTURBATIONS OF WOLF'S COMET.—Allusion was lately made in these notes to the work of M. Kamensky on this comet from its discovery in 1884 to the present time, and to the large changes in its orbit likely to arise from the very near approach to Jupiter this year. He has now calculated these changes, and gives the results in *Astr. Journ.* No. 807. The least distance occurred on September 26, when it was one-eighth of a unit, so that Jupiter's direct action was $1\frac{1}{2}$ times that of the sun, and the assumption of elliptical motion ceases to be the smallest approximation to the truth. On the other hand, a remarkable approximation may be obtained by assuming the motion to be in a hyperbola about Jupiter, which is equivalent to treating the action of the sun on the two bodies as identical during the time of near approach. Incidentally this gives an opportunity for using the equations for hyperbolic motion, which are given in the text-books but very seldom employed. The results obtained by this simple method are quite close to those of the more rigorous investigation. A curious point is that the present perturbations are about equal in size but opposite in direction to those at the approach of 1875, so that the comet now returns very nearly to its 1875 orbit. The period is increased from $6\frac{3}{4}$ to $8\frac{1}{4}$ years, and the perihelion distance from 1.53 to 2.40. It fortunately happens that at the next perihelion passage, 1925, Oct. 28.4, the comet will be almost in opposition, so that the distance from the earth will attain its minimum value, 1.40. Prof. Kamensky hopes that it may not be beyond visual or photographic reach with large instruments: if it should be found, most of the credit will belong to him; if not seen then it will almost certainly be permanently lost.