

Sandias) his famous observations on "The Constitution and Development of the Society of Termites"—one of the finest entomological works ever written. In the course of this work he was led to make a detailed study of the peculiar protozoa with which many termites are infested; and these studies—begun in 1885, and ending with his extensive and beautifully illustrated memoir of 1917—are scarcely less important than those which he has published on the termites themselves.

In 1887 he began (with Calandruccio) a very different investigation which ultimately yielded results no less remarkable—his study of the life-history of the eels. The development of the eel is a problem which had puzzled biologists from the time of Aristotle; but in 1896 Grassi was able to announce that he had solved it, in its general terms, though full details of his work were not made known until 1913, when his magnificent monograph on "The Metamorphosis of the Murænoïds" appeared.

From about 1890 until 1892 Grassi was also occupied (with Feletti) in studying the malarial parasites. In 1898 he returned to this subject with renewed energy, and succeeded in 1898 and 1899—with the collaboration of Bignami and Bastianelli—in solving once for all the problem of the mode of transmission of human malaria. He was then able to demonstrate that certain mosquitoes (*Anopheles*), and these mosquitoes only, convey malaria from man to man; and he worked out, for the first time, the entire life-history of the human malarial parasites in these insects. The importance of these discoveries needs neither emphasis nor advertisement. His great monograph—"Studies of a Zoologist on Malaria"—was published in 1900. It is still unsurpassed, and is universally acknowledged by protozoologists as one of the classics of their science.

About 1905 Grassi turned his attention to another organism of vast economic importance—*Phylloxera*, an insect which has done incalculable damage to the vineyards of Europe since its accidental introduction from America some sixty years ago. With various collaborators (Foà, Topi, and others) he continued to labour

at the biology and control of this insect until the end of his life. His most important publication on the subject—issued by the Italian Ministry of Agriculture in 1912—has recently been described by a distinguished entomologist as "a milestone in the history of entomology."

Another important entomological work by Grassi is his memoir on the sand-fly (*Phlebotomus*). In this he gave (1907) the first good account of the structure and life-history of an insect which has recently attracted much medical notice, owing to the part which it appears to play in the dissemination of more than one human disease. During the last few years of his life Grassi returned again to the study of malaria and its prevention, and published—among other works—a series of most interesting papers on the biology of mosquitoes.

These are some of the works for which the name of Battista Grassi will ever remain famous in zoology—both pure and applied—and in medicine. Severally his contributions to helminthology, to entomology, to protozoology, or to ichthyology, would be sufficient to establish the reputation of a lesser man in any one of these sciences: taken together, as the work of a single individual and his assistants, they constitute a record of achievement almost unparalleled in the history of zoology.

CLIFFORD DOBELL.

WE regret to announce the following deaths:

Commendatore Giacomo Boni, director of the excavations in the Forum, Rome, and on the Palatine, where he made important archæological discoveries in the Temple of Vesta and on the site of Domitian's Palace, respectively, on July 7, aged sixty-six years.

Dr. Charles Forbes Harford, a founder and the first Principal of Livingstone College, Leyton, on July 4, aged sixty years.

Dr. Felix Klein, For. Mem. R.S. and Copley medallist of the Society, professor of mathematics in the University of Göttingen, who has added to our knowledge of non-Euclidean and carried out researches in the theory of functions, on June 22, aged seventy-six years.

### Current Topics and Events.

IN 1915 a new chapter was opened up in the cancer mystery by the discovery of Yamagiwa and Ichikawa that cancer can be successfully induced in rabbits by the prolonged application of gas works' tar. This result was soon confirmed, and during the last ten years a large number of tumours have been produced in mice, rabbits, and even in fowls. In addition to cancer in the strict sense, other malignant tumours have developed as a result of the application of tar products. There is no longer any doubt that the induced tumours are true blastomata. They possess every attribute which has been associated with the idea of malignancy. Tar is, of course, not the only chemical irritant which produces tumours, but it is the one that most readily does so under experimental conditions. It is also known that different tars vary greatly in their cancerogenic properties. The actual agent in the tar has been sought, and although not yet completely identified, a large body of knowledge has

already grown up on the subject. Apparently the acids and bases of tar can be removed while the cancerogenic agent remains.

A SHORT time ago, E. L. Kennaway, of the Cancer Hospital Research Institute, London, obtained results which pointed to the conclusion that isoprene compounds prepared at about 820° C. are more active than the original coal tar from which they are obtained. In a more recent paper (*Brit. Med. Journ.*, 1925, ii. p. 1, July 4) Kennaway has made a further important contribution to the cancerogenic properties of "tars," by showing that acetylene heated to 800°-900° C. is capable of producing tumours. A Californian petroleum, in itself apparently incapable of producing cancer, became so when heated to 800° C. in a current of hydrogen. More extraordinary still, he found that human skin or yeast dried and heated to 920° C. produced malignant tumours in mice. Although these products, up to the present, can only be produced at



high temperatures, "it is possible," as Dr. Kennaway says, "that the body at its own temperature takes months or years to produce a quantity of some substance sufficient to influence the growth of a few cells only"; whether this is so or not, it seems probable that we are getting definitely nearer the solution of the cancer problem.

YET another step in the progress of our knowledge of cancer is promised in the announcements which have appeared of a paper by Dr. W. E. Gye, to appear in the *Lancet* of July 18. At the time of writing no details are available, but it would seem that Dr. Gye, who has been supported by the Medical Research Council and assisted by Mr. J. E. Barnard and Dr. J. A. Murray, the latter of the Imperial Cancer Research Fund, has discovered a filter-passing organism in cancers of birds, rodents, and other mammals, including man. The organism itself, however, does not give rise to cancer when injected into healthy animals; it requires the presence of a so-called specific factor obtained by injecting a tumour extract from the species of animal which is being used for experiment. In the presence of extract of a sarcomatous tumour freed from the newly discovered organism, the organism itself, whatever its source, is able to cause sarcomatous growth in an animal of the species from which the extract has been made. Extracts of carcinomatous growths would appear to be ineffective. Mr. Barnard's work on the use of ultra-violet light and other short-wave radiation for photographing, under the microscope, objects of very minute size, is well known, and his share in the present work has apparently been concerned with photographing the organism. If the discovery is fully substantiated, it should mark an important advance in medical knowledge.

ON Monday, July 13, the King, who was accompanied by the Queen, opened the new house of the British Medical Association, Tavistock Square, London, in the presence of an assembly of medical representatives from the Dominions and Colonies, from many organisations in Great Britain, and from the continental countries of Europe, and a special delegation from the American Medical Association. Shortly before the arrival of the King and Queen, the memorial gates at the entrance of the courtyard of the building were dedicated by the Archbishop of Canterbury to the memory of the 574 members of the Association who lost their lives in the War. The King and Queen were attended by Mr. Neville Chamberlain, Minister of Health, and proceeded to the Great Hall of the new building, where the chairman of the Council of the Association, Dr. R. A. Bolam, read an address outlining the origin and aims of the British Medical Association. Throughout its existence, the Association has striven to maintain the traditions of the medical profession and to keep its members alive to the advance of the science and art of medicine. Medical men, he said, have a duty not only to their patients but also to the community in the protection of public health. Reference was also made to the fact that there are now no less than

2250 women members of the Association. In his reply, the King remarked on the great increase in membership and usefulness of the Association since its foundation in 1832. The importance of qualifying examinations and prescribed training as a preliminary to admission to the Medical Register was emphasised, with the warning that "vigilance must always be exercised in order that your profession may keep abreast with the advance of science." In this connexion reference was made to the value of post-graduate study. Passing on to the relation of the medical practitioner to public health, the King said that the welfare of the peoples of the British Empire depends largely upon an efficient and well-organised health administration," and referred to the medical practitioner as a "missionary and teacher of public hygiene and of personal health."

ON Thursday, July 9, the Sargant Laboratory of Plant Physiology at Bedford College for Women, London, was opened by Lord Justice Sargant. The Principal, in introducing Lord Justice Sargant, spoke of the sympathetic interest Miss Alice Sargant had shown towards Bedford College and of the important share she took in furthering the acquirement of the present unique site in Regent's Park. Upon her death Miss Sargant had bequeathed a sum of 1000*l.* for the furnishing of a library and herbarium in the Botany Department and for the erection of a physiological greenhouse. The War intervened before the latter project was carried out and post-War conditions rendered the unexpended balance inadequate for the purpose intended. Recently, however, as the result of a legacy, the Council of the College has been able to provide a sufficient additional sum to permit the erection of a small laboratory and experimental greenhouse.

IN declaring the new Sargant Laboratory of Plant Physiology open, Lord Justice Sargant acknowledged the kindly thought that had connected his sister's family name with the laboratory. He pointed out that Alice Sargant's contact with botany was artistic and literary rather than scientific, and that in his own mind he would always associate with the building the memory also of his other sister, Ethel Sargant, who took a keen interest and an active part in scientific botany. A vote of thanks was moved by the chairman of Council, Sir Wilmot Herringham, and seconded by the head of the Botany Department, Prof. W. Neilson Jones, after which the new laboratory was inspected. Among the exhibits were a collection of portraits of botanists and others after whom plant genera had been named, together with specimens of the plants concerned, demonstrations of researches carried out by various members of the Department of Botany, apparatus for the study of plant physiology, and a number of interesting plants. The Botany Department of Bedford College is fortunate in possessing a small but well-stocked botany garden, inspection of which provided an attractive item in the entertainment of those who attended the ceremony on July 9. The position of the new laboratory in close proximity to the garden ensures a supply of suitable plant material for work in plant physiology.



AN influential and representative deputation waited on Mr. L. C. M. S. Amery, Colonial Secretary, at the Colonial Office on July 7 to urge the claims of the Imperial College of Tropical Agriculture to continued Government assistance on an extended scale. It comprised several members of Parliament of both Houses, eminent men of science, and representatives of the principal organisations associated with the Dominions and Colonies in Great Britain. Lord Burnham, who introduced the deputation, read a letter from Mr. Ramsay MacDonald expressing interest in the movement and his hopes for its success. Sir Arthur Shipley then briefly reviewed the history of the College, and, referring to the financial position, pointed out that funds were urgently needed to enable the Governing Body to proceed with the erection of hostels and the provision of an estate. Thus the College might be placed in a position to provide for the requirements of the students, who would be proceeding to it under the scheme prepared by the Committee of which Lord Milner has been chairman, for the training of officers for the Agricultural Departments throughout the Empire. The cost of the hostel he placed at 25,000*l.* and that of the estate for research work and the practical study of farming in all its branches at 25,000*l.* Mr. Amery in reply stated that the case of the College has already been before the Committee of Civil Research, and that he hopes now to take the matter up more definitely and directly with the Chancellor of the Exchequer with the view of seeing what financial support is possible. He has, he said, the greatest faith in the future of the College, which he believes will develop into an Imperial University of Tropical Agriculture.

A MEMORANDUM regarding the probable amount of monsoon rainfall in 1925 was issued early in June by Mr. J. H. Field, Director-General of Observatories of the Meteorological Department to the Government of India. The rainfall of India is affected by previous weather conditions over various parts of the earth. For the Peninsula the indications from Java, the Cape, South America and Dutch Harbour are slightly unfavourable this year, but their combined effect on monsoon prospects is small. For north-west India a prejudicial influence exists this year from the very large excess of rainfall in south Rhodesia, and this receives some little support from conditions at Dutch Harbour; the effect of the other factors is negligible. For the Bay monsoon current the only indications as yet discovered are those from the wind and rainfall of Seychelles; the rain has been normal, but the strength of the wind is a favourable feature. Monsoon rainfall would appear to be likely to be normal or in defect in the Peninsula, normal or in excess in north-east India, and in defect in north-west India.

SIR RICHARD REDMAYNE, formerly chairman of the Imperial Mineral Resources Bureau, which has recently been amalgamated with the Imperial Institute, South Kensington, has been appointed director of the Imperial Institute. He has accepted the appointment on the understanding that it will be for a short period only, in order that he may supervise the amalgamation of the two bodies.

AT the ordinary meeting of the Royal Society of Edinburgh held on July 6, the Makdougall Brisbane Prize for the period 1922-1924 was presented by the president to Prof. H. Stanley Allen, professor of natural philosophy in the University of St. Andrews, for his investigations in theoretical physics, particularly for his communication to this Society on the magnetic character of the quantum, and on static molecular models of hydrogen and helium.

THE Chalmers Memorial Gold Medal was presented at the recent annual general meeting of the Royal Society of Tropical Medicine to Prof. Warrington Yorke, professor of parasitology in the University of Liverpool and Liverpool School of Tropical Medicine, in recognition of his work on trypanosomiasis, malaria, and other subjects. The medal is awarded biennially to persons less than forty-five years of age for "researches of outstanding merit contributing to our knowledge of tropical medicine and hygiene."

M. A. F. DINA and his wife have given the Paris Academy of Sciences a sum of a million francs, the income from which is to be devoted to the manufacture or purchase of astronomical instruments for observatories concerned with astronomy, meteorology, or geophysics, together with an astronomical library for such observatories.

PROF. W. M. DAVIS, emeritus professor of geology at Harvard University, and Dr. G. Holm, Geological Survey of Sweden, Stockholm, have been elected foreign members of the Geological Society. Prof. P. Lemoine, professor of geology in the National Museum of Natural History, Paris; Dr. V. Madsen, of the Royal Library, Copenhagen; Prof. P. Niggli, professor of mineralogy and petrography in the University of Zürich; Prof. J. F. Pompeckj, professor of geology in the University of Berlin; Dr. T. W. Vaughan, of the United States Geological Survey; and Dr. M. D. Zaléssky, Leningrad, have been elected foreign correspondents.

THE Summer Meeting of the Royal Cornwall Polytechnic Society will be held on July 21-24 at the Polytechnic Hall, Falmouth. An exhibition of Cornwall art and handicraft will be opened on July 21 by the president, the Right Hon. Viscount Falmouth, who will give an address on "Recent Developments of Physical Science," which will be followed by a paper by Mr. Henry Jenner on "The Holy Wells of Cornwall." Other papers to be read during the meeting are: "Boulton and Watt in Cornwall," A. K. Hamilton-Jenkin, and "The Mining Coinage of Cornwall," E. W. Newton. On Friday, July 24, a lecture will be given by Dr. W. D. Prendergast on Cornwall and the ceramic industry.

A MEDAL for archæological research has been instituted, and attached to the Board of Archæology in the University of London. The first presentation was made at University College, on July 7, by Prince Arthur of Connaught, to Sir Flinders Petrie in recognition of his half-century of work for archæology. The medal bears Sir Flinders Petrie's bust on one side, and on the other the searching ibis, the hieroglyph of



"finding," placed before the head of Khufu, which was found by Sir Flinders. In returning thanks for the presentation Sir Flinders compared the expansion of the knowledge of man by the methods of archæology, to the extension of our knowledge of the universe by spectrum analysis, two movements which had grown simultaneously within his memory.

THE following are among the Civil List pensions recently granted:—Miss Maria Birch, in recognition of the services rendered by her father, the late Dr. Walter de Gray Birch, to the science of archæology, 100*l.*; Mr. J. T. Cunningham, in recognition of his services to zoological science and economic zoology, 100*l.*; Prof. Patrick Geddes, in recognition of his public and educational services, 100*l.*; Mrs. Amelia Sarah McLeod, in recognition of the services rendered by her husband, the late Prof. Herbert McLeod, F.R.S., to science, 45*l.*; Mrs. Emily Rambaut, in recognition of the services rendered by her husband, the late Dr. A. A. Rambaut, to astronomical science, 50*l.*

FOLLOWING a highly successful conference held at High Leigh, Hoddesdon, in September 1924, of those interested in special libraries and agencies for the collection, treatment and distribution of information, a representative standing committee was appointed to ensure continuity of the work. Assistance has been obtained from the Carnegie United Kingdom Trustees, and the proceedings of the first conference have just been issued. The committee has decided to name the body thus called into being "The Association of Special Libraries and Information Bureaux." The second conference of the Association will be held at Balliol College, Oxford, during the week-end September 25-28; full particulars can be obtained from the Organising Secretary at the Offices of the Association, 38 Bloomsbury Square, London, W.C.1.

*Observation*, of which we have recently received Part 3, is a periodical intended for readers of secondary school and training college age. It is issued by Leplay House, London, and as might, therefore, be expected, its keynote is the cultivation of the faculties of observation in everyday life. Its articles record the results of first-hand observations of peoples, activities, and places. Those in the present number deal, among other matters, with Sarawak, this by Mrs. Charles Hose, the Scillies and their bird life, London and its buildings, place names, wild flowers, and typical Norwegian farms. The articles are well illustrated.

WE have received from the Mellon Institute of Industrial Research of the University of Pittsburgh the list of publications and patents by members of the Institute during 1925. This gives evidence that the wide variety and practical utility of the subjects investigated in the Institute still continues. Laundry work, refrigeration, fire-extinction, smoke-abatement, and the design of ventilators are a few of the subjects of publications or patents. The subject "Jewelry from Fish Scales" recalls the famous experiment for extracting sunshine from cucumbers, to which the discovery of vitamins has given a new meaning. It

is evident from the list that industrial research as understood at the Mellon Institute embraces all the experimental sciences.

THE April issue of the Journal of the Franklin Institute contains two interesting papers, one, by Prof. Haber, on the practical results of the theoretical development of chemistry, and the other, by Prof. Donnan, on the influence of J. Willard Gibbs on the science of physical chemistry. Dr. Haber commences with a consideration of the "structural" period in chemistry, a period in which dyestuff investigation was developed. This was followed by the "thermodynamic" period. The application of thermodynamics to solution phenomena and the advent of the electrolytic dissociation theory fall within this period. In this connexion, nitrogen fixation and the use of catalysts in general are discussed. The third period is that through which we are now passing, namely, one in which atomic structure is being interpreted electrically. Capillary chemistry falls in this class, and the theories of adsorption are described in detail, simple explanations being given for Szyszkowski's empirical law and for Freundlich's adsorption isotherm. Prof. Donnan's lecture shows how firmly Gibbs laid down the foundations of thermodynamics, and an excellent account of Gibbs's method is given. The phase rule is given prominence, and Prof. Donnan shows throughout how much indebted are modern workers in this field to the fundamental researches of the great American physicist.

WE have received from Messrs. Adam Hilger, Ltd., a pamphlet entitled "Applications of X-Ray Spectrography and Crystallography to Metallurgy and to Chemical Problems," supplementary to the small volume on optical methods in research issued by the same firm. The pamphlet contains useful hints on the methods and limitations of X-ray spectroscopy, followed by suggestions as to the use of this method for the solution of practical problems in metallurgy. In illustration, examples are quoted from recent authors, showing how the deformation of crystalline aggregates as well as of single crystals produces characteristic changes in the X-ray pattern given by a metal, as in the work of Taylor and Elam, Polanyi, Bain, and others. An excellent bibliography is appended, from which, however, we miss any reference to the work published in *Stahl und Eisen* or in the *Mitteilungen der Institut für Eisenforschung*. Work of this kind has, among other things, shown the remarkable similarity between the structure of natural fibres, such as cotton and silk, and that of cold-drawn metallic wires. The mechanism of deformation of crystals is still a matter for controversy, and it seems probable that some refinement of X-ray technique will be necessary before this method can be expected to give results quite free from ambiguity. The evidence already available is, however, of the highest interest, and no metallurgist who is interested in the problem can afford to disregard it.

A SHORT but useful catalogue of second-hand science books has reached us from Messrs. W. and G. Foyle,



Ltd., 121 Charing Cross Road, W.C.2. It gives particulars of nearly four hundred works dealing with zoology in general, with separate sections relating to ornithology, entomology, and botany. The list is sent free upon request.

MESSRS. Dulau and Co., Ltd., 34 Margaret Street, W.1, have recently issued two useful catalogues (Nos. 129 and 130). No. 129 contains some 1300 books and papers on entomology, conveniently classified under the names of the insect orders, economic and general entomology, serial publications, and Arachnida. In No. 130 are listed upwards of 2000 works classified under the headings of ornithology, mammals and sport, reptilia, fish and fishing industries, conchology, general zoology, biology, Darwinism, evolution, heredity and Mendelism. The catalogues can be obtained free upon application to the publishers.

WE have received the annual booklet issued by Messrs. Burroughs Wellcome and Co., which gives instructions and formulæ for photographing with the aid of their tabloids and Photographic Exposure Calculator. It includes the technique of desensitising, and a page of plate speeds which brings the speed tables in the Exposure Calculator up-to-date. The booklet, "Photographic Signposts," is sent post free on application to Messrs. Burroughs Wellcome and Co., Snow Hill Buildings, London, E.C.1.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned: A full-time teacher for mining courses under the County Council

of the West Riding of Yorkshire—The Technical Branch, County Hall, Wakefield (July 23). An assistant master to organise biological teaching in Campbell College, Belfast—The Headmaster (July 25). An assistant lecturer in mathematics in the University of Manchester—The Internal Registrar (July 31). A junior demonstrator of anatomy in the University of Birmingham—The Secretary (July 27). An assistant lecturer in engineering in the University of Manchester—The Internal Registrar (August 1). A demonstrator in physics in the University of Leeds—The Registrar (August 6). Lecturer in physiology in the University of Birmingham—The Secretary (August 24). The Dutton Memorial professorship of entomology in the University of Liverpool—The Registrar (October 1). The Ormond professorship of music in the University of Melbourne; the senior lectureship in philosophy in the University of Melbourne—The Agent-General for Victoria, Australia, Melbourne Place, Strand, W.C.2 (October 15). A full-time lecturer in mathematics at University College, Southampton—The Registrar. Lecturer on tropical hygiene at the London School of Hygiene and Tropical Medicine—The Secretary, 23 Endsleigh Gardens, N.W.1. A demonstrator in physics in the University of Toronto—Prof. J. C. McLennan, Athenæum Club, Pall Mall, S.W.1. Senior physics master at the Cowley Boys' School, St. Helens—Secretary for Education, Education Office, St. Helens.

ERRATUM.—In the issue of July 4, p. 22, col. 2, line 22, for "South American" read "South Italian."

### Our Astronomical Column.

THE DELPORTE OBJECT.—M. Delporte has issued a notice of erratum in his telegram announcing the finding of this object. The figures  $+1^m 48^s$ , N.  $14'$  were really the motions in R.A. and Decl. in 2 days, not 1 day. Making this alteration, it was soon found that the object is not new, but is identical with the minor planet 29 Amphitrite, which is in opposition next October, some six months before its perihelion. It had already been perceived that Amphitrite was close to the position given by M. Delporte, but the original statement of its motion seemed fatal to identity.

Amphitrite is one of the brighter members of the family, and was discovered by Mr. A. Marth in London in 1854.

THE NEAR APPROACH OF EROS IN 1931.—Dr. G. Witt, who discovered Eros in 1898, has been studying its perturbations for many years, and gives in *Astr. Nach.*, 5375, an ephemeris from October 1, 1930 (parallax  $12.2''$ ), to May 5, 1931 (parallax  $16.4''$ ). It is nearest to the earth (parallax  $50.3''$ ) on January 30, fifteen days after perihelion. Its magnitude will then be 7.1, so that it will be easily visible in a field-glass.

The declination is  $+44^\circ$  on October 1,  $-3^\circ$  on January 30,  $-22^\circ$  on May 5.

The same issue of the *Astr. Nach.* contains a list of stars for comparison with Eros. Very few of them are fainter than 9.0 mag., so observations with meridian instruments are desired. Each plate of  $2^\circ \times 2^\circ$  will contain about eight of these stars. Fainter

stars will be necessary for instruments with long focus, but their places can be photographically determined, using the stars of this list as a basis. The present list contains 419 stars and follows the place of Eros for October 1 to January 8. A second list will be issued for the remainder of the apparition.

CARBON BANDS IN COMET TAILS.—M. F. Baldet has studied the effect of pressure on the band spectrum of carbon in a thermoelectronic tube (*C.R. Acad. Sci.*, Paris, April 20). He finds that at low pressures the second and third positive groups of bands and the new group recently discovered by him disappear, leaving only the third negative group, or comet tail spectrum, and the first negative (ultra-violet) group, which remain well developed. Under these conditions the emission of light is due to electronic shocks, while at higher pressures the shocks of ionised molecules with one another and with neutral atoms are concerned, giving the other band systems mentioned above. This seems to confirm Deslandres' theory of corpuscular or electronic radiation from the sun, which produces the coronal streamers and the polar aurora. So far only the negative group of nitrogen in the comet Morehouse has been ascribed to the action of this electronic radiation; but from the work of M. Baldet and others it now appears probable that the carbon bands observed in comet tails are due to the electronic bombardment of oxides of carbon at exceedingly low pressure.