

LADY SHAW.

DEEP sympathy will be felt by a large section of the scientific world at the bereavement which Sir Napier Shaw has suffered by the death on September 22 of his wife, Lady Shaw, who was well known in scientific circles. Lady Shaw was for some time lecturer in mathematics at Newnham College, Cambridge, and was the author of an original little book entitled "First Lessons in Observational Geometry," published by Messrs. Longmans, Green and Co. in 1904. In this book, a course of observational and experimental geometry was outlined similar to that afterwards adopted in schools on the recommendations of committees on geometry as the best introduction to the formal study of the subject. Lady Shaw took a very active part in many organisations and institutions concerned with education, science, and progressive development generally. She was a member of council of Queen's College, London, and of the Women's Local Government Society. She served on several committees of the British Association, and was the secretary of the Citizenship Committee which has prepared and issued some valuable reports. Lady Shaw was also a member of Council, the Executive Committee, the Education Committee, and the Health Committee of the British Science Guild, and the members of these bodies, as well as all others associated with her, hold her memory in grateful remembrance.

PROF. W. ROSER.

PROF. DR. WILHELM ROSER, one of the directors of the Farbwerke vorm. Meister Lucius und Bruening in Hoechst-on-Main, died at Frankfort-on-Main on May 20. He was an important contributor to the development of the German industry of pharmaceutical products and coal-tar dyestuffs.

Prof. Roser came from an old-known Swabian family; his father, Prof. W. F. Roser, was an eminent surgeon of the University of Marburg, and there W. Roser

was born on January 30, 1858. At this University he first studied mathematics, a science to which he devoted his hours of leisure. Afterwards he changed over to the study of chemistry under the guidance of Zincke. After a short stay with Fittig in Tübingen, he returned to Marburg and received his doctorate in 1882 for a research upon terebinic acid. For his studies regarding phthalyl-derivatives he received the *venia legendi* in 1885, and researches concerning pyridine and quinoline derivatives enabled him to clear up the constitution of narcotine, an opium alkaloid.

After his nomination as a professor in 1892, the Hoechst firm engaged Prof. Roser as director of the scientific department of their works, at a time when the German chemical factories, having successfully produced acetanilide, phenacetine and antipyrine, were devoting themselves to the further investigation and production of medicines. Prof. Roser was able to direct this work with success. He took part in the elucidation of the constitution of adrenaline and in the synthesis of rivanol, while in the dyestuff branch he was also very successful. It was his main task to introduce young chemists who had come from the High Schools into the works, to the way of working and thinking necessary for technical practice. Several generations of technical chemists owe him their education. He himself was a taciturn man of keen observation and wide knowledge, highly esteemed by industrial chemists as well as by men of science.

WE regret to announce the following deaths:

Mr. Malcolm Fraser, late Registrar-General and Government Statistician of Western Australia, on September 17, aged sixty-six.

Dr. F. J. H. Jenkinson, since 1889 Librarian of the University Library, Cambridge, on September 21, aged seventy.

Prof. R. Pumpelly, formerly professor of mining geology at Harvard University, and for many years on the United States Geological Survey, on August 10, aged eighty-five.

Current Topics and Events.

It would appear that the protests which have appeared in the *Times* and elsewhere against the proposed erection of a wireless station at Avebury have been successful. Sir Charles Oman in his presidential address to the Gloucestershire Archaeological Society, as reported in the *Times* of September 14, announced that he had received a letter from Sir L. Worthington Evans, the Postmaster-General, stating that the proposal would probably be dropped. Recent experience has made it clear that existing legislation for the protection of sites of archaeological importance is inadequate, while it affords no guarantee in the case of any site which is not scheduled under the Protection of Ancient Monuments Act. In the present instance, it is peculiarly disturbing that Government Departments were concerned in what can only be described as an act of vandalism. During the recent meeting of the British Association at Liverpool, reference was made to this matter on more than one occasion, and before the Association

dispersed, a resolution was passed which, while instancing the cases of Holmbury Hill, Avebury, and Lulworth Cove, urged strongly in general terms the extension of the powers which may be exercised in the protection of sites of natural beauty or archaeological interest.

THE use of pulverised coal is spreading steadily, and at the present time more than 20,000,000 tons per annum is being burnt in the United States and Canada alone, largely in the cement, iron and steel, and glass industries. Also the use of coal in a fine state of division is being considered in connexion with the manufacture of briquettes, low-temperature carbonisation, and total gasification processes, such as producer gas. The most striking progress, however, during the last three or four years has been in the use of pulverised coal for steam generation. Since 1920 some of the largest and the most important power stations in the world have adopted this method

of firing, and we understand that to-day more than 1,000,000 tons per annum is being burnt under steam boilers on the "Lopolco" system, while in the next few months, as soon as plants now in course of erection or conversion are completed, the figure will exceed 2,500,000 tons. The pioneer large boiler plant installation for pulverised fuel is the "Lakeside" station of the Milwaukee Electric Railway and Light Co. on Lake Michigan, 40,000 kw. of which was started up in December 1920. This boiler plant is held to be the most efficient in the world, running all the year round at 85-86 per cent. efficiency. The first large pulverised fuel boiler plant in Europe is now being erected at the Vitry power station, Paris.

Just forty years ago, on September 29, 1883, Prof. Dr. Carl Duisberg entered the employment of the Farbenfabriken Bayer and Co. in Elberfeld, and the influence he has exerted upon the development of the German industry of coal-tar dyestuffs and pharmaceutical products has made his name renowned throughout the world of applied chemistry. Prof. Duisberg received his doctorate at Jena; he then went to Munich in order to complete his education under Adolf von Baeyer, and at that time laid the foundation of the great friendship which for the future connected him with that eminent chemist and with a large number of his pupils. Shortly after he entered the Farbenfabriken, and succeeded in making essential improvements in the manufacture of substantive cotton dyestuffs. He thereupon became the head of the firm's scientific laboratory, in which he mainly endeavoured to put the purely chemical work on a broader basis than heretofore. At the same time he began to organise the whole business, first by dividing the work of the chemists according to the different kinds and classes of dyestuffs, etc., and then by uniting in one working concern the four principal German firms which make direct cotton dyestuffs. This was the first step in the formation, later on, of the "I.G.," the large concern of German coal-tar dye makers. The site of the works in the narrow Wupper valley of Elberfeld having become insufficient for the rapidly increasing manufacture, it was resolved to build large modern works, and under Prof. Duisberg's direction a magnificent plant was erected at Leverkusen, near Cologne. During the War, after some years of keen competition, the remaining dye-making firms joined this first amalgamation, chiefly through Prof. Duisberg's influence, thus forming one large combine in which the firms preserve their individualities but, at the same time, all proceedings are directed by a uniform programme, and each firm partakes of the profits of the whole concern according to its share in the work. In addition to his activities at the Farbenfabriken, Prof. Duisberg is well known by many other achievements in chemistry, while his great versatility is manifest from the volume containing his essays and speeches published by the Farbenfabriken on the occasion of his jubilee.

THE intellectual stimulus to China of the revolution of 1911 is still manifest by increased scientific and

intellectual activity. Despite the political disturbances of the last two years, the scientific institutions are growing in number and usefulness. The Geological Society of China was founded last year, and held its first annual meeting at Peking in January under the presidency of Dr. V. K. Ting. This year has also seen the establishment of "the China Society of Science and Arts," of which the *China Journal of Science and Arts* is the official organ. It is also the journal of the Shanghai Chemical Society. The fourth number, issued in Shanghai in July (price 2 dollars, pp. 303-424), edited by Mr. A. de C. Sowerby and Dr. J. C. Ferguson, includes an interesting series of papers and notes on scientific and artistic work in China. The articles deal with the Chinese fisheries of *Amphioxus*, which in places is a food-fish; the Chinese "Mudskipper," *Periophthalmus cantonensis*, which Mr. Sowerby suggests is not merely in the process of evolution to a terrestrial life but may give rise to a race that may replace the higher vertebrates; "The Dragon Mines," by Dr. J. Gunnar Andersson, who describes the ancient Chinese excavations for fossil vertebrates for use as medicine, and also the recent research on Chinese vertebrate palæontology; the war on insect pests, and on the rôle of bacteria; ancient Chinese coins, by E. F. S. Newan; Chinese female names, by J. C. Arlington; Chinese landscape gardening, by Miss Ayscough; a recent exhibition of Chinese pictures; a journey to the Yangtze gorges for photographic work, by H. F. Carey; the dissociation of prehnite, zoisite, and epidote, by E. Norin; the conditions of the Chinese soap manufacture, by Mr. Hsu; and the aborigines of Western China. There are also various reviews and notices of the work of the Chinese scientific societies. The Journal is well illustrated, and deserves the support of all interested in China, as it gives a useful general review of scientific, artistic, and literary work in and in connexion with China.

SIR HUMPHRY ROLLESTON will deliver an inaugural address on "The Problem of Success for Medical Women" at the London (Royal Free Hospital) School of Medicine for Women on October 1, at 3.30 P.M.

THE Research Association of British Flour Millers has been approved by the Department of Scientific and Industrial Research as complying with the conditions laid down in the government scheme for the encouragement of industrial research. The secretary of this Association is Mr. G. H. Ball, 40 Trinity Square, E.C.

THE *British Medical Journal* announces that the Canadian Medical Association is arranging for a Lister Oration to be given once every three years. The first of these will be given next year at the annual meeting in Ottawa by Dr. John Stewart, of Halifax. Dr. Stewart was one of Lister's house-surgeons in the early days of the latter's work in Edinburgh.

ACCORDING to the New York correspondent of the *Times*, a number of fires broke out in many counties of California on September 17, one of which spread to the residential district of Berkeley. Some six

hundred houses were destroyed, including the residence of Dr. B. I. Wheeler, president-emeritus of Berkeley University, but all the buildings of the University itself were saved. The damage is estimated at 2,200,000*l.*

THE Institution of Petroleum Technologists is now installed in its new offices at Aldine House, Bedford Street, Strand, London, W.C.2. In addition to a general office, council room, and a well-appointed library, a large room has been fitted up as a members' room. As a house-warming for the new offices, the president and council will receive members and their friends on Wednesday evening, October 3, from 8 to 10 P.M. During the evening scientific apparatus will be exhibited and demonstrated. Admission is by ticket only.

THE lectures on recent excavations given during the summer by Miss Claire Gaudet will be repeated this winter on Thursdays, commencing October 4, at the British Museum. The subject, as before, will begin with the earliest known civilisation as shown by the discoveries made within the last few years in Mesopotamia, and will include the excavations at Ur and this year's work at Kish, now known to have been the capital of the first Empire in the world's history, and said to date from about 5000 B.C. The evolution of architecture from these early times until the Roman and early Christian periods, showing the classical influence on all subsequent art up to the present day, will form the basis of the lectures, including whenever possible the arts and crafts of the people. Further particulars may be obtained from the Hon. Secretary, 120 Cheyne Walk, Chelsea.

SIR ARTHUR KEITH, in his annual report on the museum of the Royal College of Surgeons, refers to the completion of the series of exhibits illustrating the principles of pathology. In 1910, Prof. Shattock and Mr. Cecil Beadles commenced to select, arrange, and catalogue specimens. The War interfered with this work; but six further stands were interpolated this year with the noteworthy result that, for the first time, "a complete and systematic treatise on disease has been written, not in words, but in illustrative specimens," and the scope of the pathological section is regarded as fixed. Mr. Cecil Beadles is now in charge of the National War Collection, which will soon be arranged in accordance with an approved scheme. The president of the Royal College of Surgeons of Edinburgh has been given leave to make a selection from War specimens left in store, for the museum of his college. Among notable additions made to the Museum during the past year are a cast of the tooth held by Dr. H. F. Osborn to indicate the existence of a human genus, *Hesperopithecus*, in N. America during the Pliocene period; a skeleton, probably of Anglo-Saxon date, showing evidence of infantile paralysis, "the earliest trace of this disorder in England"; and the late Celtic remains found at Wortley, Hants, presented by Mr. R. W. Hooley.

PORTO SANTO, the northern island of the Madeira Archipelago, has a population of nearly three thou-

sand, and the inhabitants have the reputation of being free from dental caries. Dr. M. C. Grabham visited the island recently and examined six hundred natives, twenty-eight of whom were found to be cases of well-established caries. All except seven of these people, however, came from Madeira, and only two of the seven showed the sign which characterises the Porto Santo dentition and is associated with immunity from caries. Early in life, natives of the island develop this characteristic, which consists of a slight yellow band on the upper incisors, and whenever this yellow stain is present, a sound set of teeth accompanies it. The line or band occurs and develops with a regularity which gives evidence of the permeation of the blood fluids in the interstices of the columnar enamel and is associated with an influence protective against the access of caries. Both the stain and the protective influence appear to be derived from the highly mineralised water of the island, the springs of which are rich in chlorides, carbonates and sulphates, in contrast with the sweet waters of Madeira. Dr. Grabham found no scurvy on the island, but many cases of pulmonary disorder. Diarrhoea and alimentary ailments were singularly absent, and the mineralised waters seemed inimical to intestinal parasites. There was no existing instance of malignant disease. Traditionally some cases have occurred, but no form of cancer has taken root at Porto Santo, and Dr. Grabham is inclined to associate this exemption with the simple feeding of the people and with the absence of animal fats, except lard, from the food, and lard is known to be deficient in the vitamin necessary to promote growth and prevent rickets. Food is taken cold; there is no milk or green vegetables, and nothing to involve grinding mastication. The main sustenance is derived from maize boiled with a modicum of lard, with the occasional addition of fish and an onion or two. At the Liverpool meeting of the British Association, where Dr. Grabham described the results of his inquiry, he showed a skull (since deposited in the Hunterian Museum) of a Porto Santo man of about sixty years of age, taken promiscuously from an exposed grave, whose teeth were all sound: and also exhibited many specimens of the soil, the vegetation, and the mineral water with analyses.

AMONG the forthcoming books announced by the Old Westminster Press is the 3rd edition of "Popular Fallacies" by A. S. E. Ackermann, which contains 696 pp. of new matter, and deals with 1350 fallacies, including the 460 of the 2nd edition.

THE Oxford University Press will publish shortly an original work, by Mr. R. T. Gunther, on the instruments used by early men of science, under the title "Early Science in Oxford." The work will be issued in two volumes—one on chemistry, mathematics, physics and surveying, and the other on astronomy. No university is richer in the apparatus and records of bygone men of science than Oxford. Mr. Gunther's illustrated account of her early science is the outcome of a first attempt to direct attention

to those instruments, and to early descriptions of instruments, by which scientific studies in the university have been advanced.

DR. D. H. SCOTT is bringing out through Messrs. Macmillan and Co., Ltd., "Extinct Plants and Problems of Evolution," a volume founded on a special course of lectures given in 1922 at the University College of Wales, Aberystwyth, the object being to sketch, in broad outline, the geological history of the plant-kingdom, in its bearing on the theory of descent. Messrs. Macmillan also announce "Life in Southern Nigeria: The Magic, Beliefs, and Customs of the Ibibio Tribe," by Amaury Talbot,

Resident, Nigeria; vol. iii. (Mammalia) of Prof. von Zittel's "Text-book of Palæontology," revised by Dr. Max Schlosser, translated under the direction of the late Dr. C. R. Eastman, by Marguerite L. Engler and Lucy P. Bush, and revised by Dr. A. Smith Woodward; and a new and revised edition of Prof. W. J. Sollas's "Ancient Hunters."

Errata:—In the article on "The Earth's Magnetic Field for 1922," by Dr. Louis A. Bauer, in our issue of August 25, the formula on p. 295 should be given the number (1); the second author mentioned in the fourth paragraph, third line, p. 296, should be Mr. H. Furner instead of Prof. H. H. Turner.

Our Astronomical Column.

THE SOLAR ECLIPSE OF 1922 AND EINSTEIN'S THEORY.—The current number of the Lick Observatory Bulletin, No. 346, contains the results of the observations on the deflexion of light in passing through the sun's gravitational field made during the total solar eclipse of September 21, 1922, at Wallal, Western Australia. The authors, Prof. W. W. Campbell and Mr. R. Trumpler, give all details for this particular research, which represents only a part of the programme of the William H. Crocker Eclipse Expedition from the Lick Observatory. Two very interesting diagrams show at a glance the type of the results obtained. The first of these is a star chart of the neighbourhood of the eclipsed sun containing the 92 stars actually measured for the investigation. The observed relative displacements of the stars are indicated by short lines oriented according to the directions of displacements. The outline of the brighter parts of the corona as well as the limit of the faintest traces of coronal light are indicated. The second instructive diagram shows the observed radial displacements for each star as a function of the star's angular distance from the sun's centre, while for comparison sake a curve is given indicating the values predicted by Einstein's theory. This graphical representation demonstrates the coincidence between the observed and the predicted light deflexions. By arranging the stars in groups according to their distance from the sun's centre the observed relative radial displacements can be seen from the accompanying table.

Group.	No. of Stars.	Weight.	Mean Dist. from Sun.	Obs. Rad. Displ.	Theoretical Rad. Displ.
1	8	9.09	0.64	+0.64	+0.70
2	11	19.42	1.06	+0.35	+0.37
3	10	20.15	1.40	+0.30	+0.24
4	8	22.41	1.66	+0.16	+0.17
5	9	21.10	1.90	+0.17	+0.13
6	8	24.67	2.00	+0.15	+0.11
7	11	21.32	2.22	+0.08	+0.08
8	13	21.37	2.55	-0.09	+0.02
9	14	22.78	2.97	-0.04	-0.03

It will be noted that the observed radial displacements given in this table are in remarkably good agreement with the values predicted on the basis of Einstein's theory. The authors point out also that even the stars between 1.25° and 2.25° from the sun's centre, which lie entirely outside of any trace of the corona,

show the light deflexion well marked, an effect that would be difficult to explain by an extended solar atmosphere.

EPHEMERIDES OF ALGOL VARIABLE STARS.—At the meeting in Rome of the International Astronomical Union in 1922, the representatives of the Cracow Observatory undertook the calculation and publication of these ephemerides. No. 1, containing these calculations for the second half of 1923, has lately come to hand, edited by Th. Banachiewicz. The explanatory matter is printed both in Polish and in Peano's flexionless Latin, the latter being easy to read.

Comment is made on the fact that from the date January 1, 1925, the astronomical day will begin at midnight, which will cause a break of continuity in formulæ that use the Julian day (beginning at noon). To avoid confusion, it is suggested that a new cycle of days be employed for this purpose, the zero date being the midnight at the beginning of January 0, 1801 (Greenwich). This is adopted in the present work, and tables are given to reduce calendar dates to it. Tables are given for 31 stars, including Algol, the adopted elements being corrected by recent observations, made in several cases by J. Gađomski at Cracow. The times of minimum are given to the third decimal of a day (about 1½ minute).

Since all the minima occurring on each day are arranged on the same page and in the same line, it is a very simple matter to draw up a programme of work on any given night.

FURTHER SEARCH FOR INTRA-MERCURIAL PLANETS.—Though we know from the presence of the Zodiacal Light that there is a considerable amount of scattered matter inside the orbit of Mercury, it becomes more and more unlikely with each total eclipse that there is any single body of sufficient size to be separately discerned or photographed. Prof. Campbell and Mr. Trumpler have made a careful search on the large plates (17 inches square) taken for the Einstein problem in the eclipse of September 1922. They embrace an area of 15° × 15°, and show 550 stars, the faintest being of magnitude 10.2. They were compared, star by star, with the comparison plates taken in Tahiti four months earlier. Nothing was detected in the search; it is noted that rapid motion might weaken a planet's image, but, allowing for this, there could not have been any planet as bright as magnitude 8.5 in the region of the plates, unless it was in the denser parts of the corona. Perrine's search in 1908 covered a region 25° × 81°, but did not reach quite such faint stars as the present series.