

Geologists' Association and of other societies. At the time of his death he was an honorary member of the Geologists' Association, of the Geological Societies of Liverpool, Manchester, and Yorkshire, of the Philosophical Society of York, of the Belgian Society of Geology, and correspondent of the Academy of Natural Science of Philadelphia.

Whitaker made many a friend, but never an enemy. Indeed, it is impossible to suppose that with so kindly a nature he could speak an unkind word. To the younger generations of geologists he never failed to lay open his stores of knowledge, or to impart the enthusiasm with which he had himself been inspired. The attainment of the truth was the dominant motive with him, and it gave him as much pleasure that it should be attained by others as by himself. Unselfishness, transparent honesty, and kindness were the conspicuous features of his truly lovable character.

A. STRAHAN.

THE death on October 29 of Dr. Ernst König, of the famous dyeworks at Höchst-am-Main (formerly Meister, Lucius, and Brüning) at the early age of fifty-five, is recorded by the *Chemiker-Zeitung*. König's reputation rests securely upon his well-known researches in the field of photochemistry. Born at Flensburg in Schleswig, he graduated at the University of Leipzig, where for a very brief period he acted as assistant to Prof. Stohmann. In 1893 he entered the service of the dyeworks at Höchst, where he eventually attained a position of the highest responsibility. At first he undertook the investigation of new coal-tar colours, but his chief interest lay in their application to photographic processes. In 1902 a photographic department of the works was formed under his direction, and two years later a new kind of three-colour collodion process, the *pinachrome* process, was invented. This was

followed by the application of dyes to chromate-gelatin emulsions and the development of the *pinatype* process. He also devoted much attention to the production of various light-filters and desensitisers. One of the most important of his discoveries was that of the panchromatic plate. The problem of extending the region of sensitiveness of the emulsion beyond the yellow into the red and even far down into the infra-red region was solved by employing as sensitisers derivatives of quinoline, containing auxochromic groups in the benzene nucleus. König was also the author of numerous scientific papers and books on photographic subjects.

WE regret to announce the following deaths:

Mr. G. Abbott, well known for his geological studies, and one of the founders of the South Eastern Union of Scientific Societies, on January 12, aged eighty.

Right Rev. L. C. Casartelli, Roman Catholic Bishop of Salford, and formerly president of the Manchester Egyptian Association, of the Manchester Egyptian and Oriental Society, and of the Manchester Statistical Society, and the author of numerous papers in oriental journals and in the proceedings of the Manchester Statistical and Geographical Societies, on January 18, aged seventy-two.

Dr. Clement Dukes, for thirty-seven years physician to Rugby School, and author of "Essentials of School Diet" and "School Health," on January 18, aged seventy-nine.

Dr. J. McT. E. McTaggart, fellow of Trinity College, Cambridge, since 1891, and the author of "The Nature of Existence," on January 18, aged fifty-eight.

Dr. Julius Morgenroth, a professor at the Robert Koch Institute for the study of infectious diseases in Berlin, and a former student and colleague of Paul Ehrlich, known for his work on immunity, on December 20, 1924, at the age of fifty-three.

### Current Topics and Events.

GREAT encouragement for industrial research is contained in a notification just made to the chairman of the British Cotton Industry Research Association to the effect that 65,000*l.* is to be received by the Association as an addition to its present income—most welcome aid towards the maintenance of the laboratories at the Shirley Institute, Didsbury. The trustees of the Cotton Trade War Memorial Fund, acting on a recommendation from the Cotton Reconstruction Board, have decided, subject to the approval of the Board of Trade, to make this grant in instalments, 5000*l.* for the year ending June 30, 1926, and 20,000*l.* for each of the three years ending June 30, 1927, 1928, and 1929. Some four years ago the Cotton Reconstruction Board made a grant to the British Cotton Industry Research Association of 200,000*l.*, a sum from which a large part of its income has ever since been derived, and the fact that the trustees have now decided to continue their help shows their great confidence in the ultimate benefits that will accrue to the cotton trade as the result of scientific research. Nothing could more strongly signalise the value of science to the industry than a gift such as this; and their appreciation of what they

describe as "the good work being carried out by the Shirley Institute" is bound to encourage not only the staff there but industrial research workers throughout Great Britain. Further, they feel that this work should be made even more widely known to the trade and to the workpeople themselves, showing that the real importance of applied science is now being more fully realised. Thus the labours of chemists, physicists, botanists, and engineers on the fundamental problems presented by cotton are being justified.

THE Dominion of Canada, which extends in an irregular way on a 3000-mile base line, with a scattered population and cities widely separated, will benefit largely by radio communication. In accordance with the agreement made between the Marconi Co. and the British Post Office, the Canadian Marconi Co. has begun to construct a "beam" station in Canada for communication with the stations which the Marconi Co. is to erect in England. The transmitting station is being erected at Drummondville, 50 miles east of Montreal, where the main office is situated, and the receiving station is at Yamachiche, which is about the same distance from headquarters. Both sections

will be operated from Montreal by a "remote control" method. The work was begun last November, and although the temperature has often been 20° below zero and the workmen have to wear gauntlets to prevent frost-bite by accidentally touching metal, good progress has been made. The transmitting aerials for communication to England are supported on five masts of steel lattice work and each is 300 ft. in height. For communicating with Australia, five 250-ft. masts are employed. The power required for each station per beam is 150 horse-power and is obtained from a local power supply company. The power delivered to the anode of the valve required for each beam, however, is only about 25 horse-power. Both the sending and receiving stations which are to be erected in England will be operated by remote control from the Central Telegraph Office in London. When the stations are completed, Canada will be brought into much closer contact with England and with Australia. It has been agreed to fix the rates so as to attract the largest volume of traffic. It is hoped that in this way the trade between the Dominions will be fostered to the advantage of the British Empire as a whole.

SIR WILLIAM BRAGG, in his Friday evening discourse at the Royal Institution on January 16, dealt with the investigation of the properties of thin films by means of X-rays. The reactions of bodies must generally depend upon the nature and condition of the surfaces at which they meet; therefore the thin surface film is of great importance. It may differ in structure, composition, or other condition from the internal portions of the body, and the fine vision of the X-rays may well help in its investigation. The X-rays cannot take notice of a single film or layer; their especial power lies in the measurement of the spacing of a set of layers. But the general laws of arrangement which are discovered in the crystal must be applicable to the thin film, and in some cases the thin film may be looked upon as one single layer of a crystal. Thus it has been possible to examine some elements of the structure of the fatty acids, alcohols, paraffins, and similar long-chain substances: to measure the thickness of the layers in which they lie, and to confirm with numerical amendments the previous measures of Langmuir, Hardy, Adam, Perrin, and other workers. It is found also that the fatty structure of these substances is shared by many more solid crystals, in which also the molecules lie more or less across the flake: bound together by side-to-side ties which are stronger than those at the ends. It is a general characteristic of crystalline structure, more particularly in the case of organic substances, that each molecule occurs in one or other of a small number of definite orientations: and that a molecule of one orientation binds together molecules of other orientations. The characteristics and probably the strength of the crystal depend upon the fact. It may explain the strength of the "black spot" of the soap film: the two layers of oleic acid on the two sides of the film are individually non-crystalline; but when they meet—the intermediate liquid being ex-

pelled—the full symmetry of the crystal can be realised, when all the orientations are present. The flaky substances are often greasy because of the toughness of each layer and the ease with which they slide on one another; pressure and rubbing tend to encourage the formation of the flakes in such substances as stearic acid.

SIR OLIVER LODGE delivered the second of his series of talks on the ether under the auspices of the British Broadcasting Company at 2LO on January 20, taking as his title "Vibrations and Waves and what they signify." Sir Oliver stated that the ether is so uniform that it is as difficult for us to discover it as a deep-sea fish would find it difficult to discover water. All knowledge has to make its way slowly and painfully against a mass of prejudice and inertia: nevertheless it is better to be slow in accepting the truth than to be ready to accept falsehood: a certain amount of opposition may be salutary. Meanwhile our theories do not alter facts: the facts are there all the time, and are independent of what humanity thinks of them. Some things we have learnt which were unknown to the ancients; but in time we too shall be ancients, and our descendants will wonder at the blindness and stupidity, even of our learned men. We used to try to explain ether properties in terms of matter: we now perceive that we must explain matter in terms of ether. We now realise that the clue to the physical universe lies in electricity and magnetism. We had thought that the way towards the light must lie in the open country of ordinary mechanics; we are now plunging into the wood—the forest of ether-dynamics. But glimpses of illumination have been caught through the branches, and have heartened the younger generation of physicists with a great enthusiasm. Those who have insight and intuition know that through this strangely unpromising country lies the road to reality.

ATTENTION is directed, in a leading article in a recent number of the *Scottish Naturalist* (December 1924), to a modern development in the protection of wild life in the United States of America. The sportsman has entered into competition with the naturalist in the race for the creation of animal sanctuaries. The reason is obvious. The development of American legislation for the protection of wild animals shows very distinctly that a progressive disappearance of sporting mammals and birds has been proceeding for many years. The result is that, in the words of the Hon. John W. Davis: "Hunting is fast losing its character as one of the most democratic of sports. The really good shooting-grounds are rapidly being taken up by clubs too expensive to be patronised by the average sportsman. Drainage of great marsh and swamp areas, the natural breeding- and feeding-grounds of wild fowl, has threatened these with extinction. We must establish shooting-grounds so that the man of average means may enjoy the ancient, healthful, and democratic pastime of shooting, and we must have the refuges if we are to continue to have the wild fowl." Accordingly a "Game Refuge Bill" has been introduced into Congress with the whole-

hearted support of the American Game Protective Association and of sportsmen generally. The combination of sportsmen and naturalists in an endeavour to protect wild life is a movement of great significance, for, as the *Scottish Naturalist* points out, "the sanctuary is the best solution of the problem of the preservation of the native fauna."

A REPORT on excavations at Ur by the Joint Expedition of the British Museum and the Museum of the University of Pennsylvania since November 1, when the season's work began, appeared in the *Times* of January 14. The main object of the work this year will be to discover whether the great ziggurat or tower was an isolated structure or formed part of a more considerable complex. Excavations to the north-west of the tower, between it and the enclosure wall, have brought to light living quarters and store-rooms of the priests of the Persian period which overlie a courtyard laid out by Nabonidus. Beneath the latter was a range of buildings dating from the 16th century B.C., and beneath this again were the walls of shrines erected by the kings of Isin and Larsa (c. 1600 B.C.). Underneath this stratum was found the terrace wall of Ur-Ungur, the builder of the ziggurat. Inscribed nail-shaped cones of fired clay were found driven into the wall, this being the first indication ever found of the use of these objects. On the south-east side of the ziggurat a "Hall of Justice" has been brought to light, a structure originally a triple gateway, of which the back door had been blocked up by a later cross wall. Mud-brick chambers had been built alongside, in or on the ruins of the double wall in which the gate tower had originally stood. An inscription on a gate socket records the restoration of the fallen tower about 650 B.C. The original gate has yet to be discovered. It is known that it had been repaired by Ishme-dagan of Larsa by 2000 B.C.

AFTER an exhaustive inquiry by a commission which visited Europe, Japan resolved in 1921 to make the metric system of weights and measures compulsory throughout the Empire and took steps to secure a primary standard metre for the country. On the advice of Prof. Nagaoka, it was decided to obtain interference apparatus similar to that used by Benoit, Fabry, and Perot, who found that the red line emitted by cadmium vapour had the wave-length  $0.64384696 \times 10^6$  metre. According to a memorandum by Mr. F. Twyman on the measurement of standards of length in wave-lengths of light, the apparatus has been constructed by Messrs. Hilger, and in the course of his study of the literature on the subject of the metre, Mr. Twyman has noted how isolated the British are becoming in adhering to the yard as the standard of length, and how little is known about this standard to the degree of precision at present attainable. The British Empire, the United States, China, Paraguay, and Turkey appear to be the only countries in which the metric system is not now compulsory, and there appears every likelihood of China adopting the system in the near future.

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KNUD RASMUSSEN, the Danish explorer, has been awarded the Charles P. Daly Gold Medal of the American Geographical Society for 1924 for his explorations in Greenland and northern North America. For twenty-five years he has studied the life of the Eskimo and explored northern lands. An account of his work and that of his assistants on the second *Thule Expedition* has appeared in the *Geographical Review* (vol. 8, 1919, pp. 116-125, 180-187). His latest expedition—the so-called fifth *Thule Expedition*—occupied three years, and the field of his work included the whole stretch of territory between Greenland and Siberia, as well as the study of the folklore, language, present distribution, migrations, and particularly the foci of migrations of all the known Eskimo tribes and families. The results will be issued in a series of volumes and maps. Among the most noteworthy of Rasmussen's earlier publications are "Greenland by the Polar Sea," "Eskimo Folk Tales," and "The People of the Polar North."

THE *Indian Antiquary*, which has been conducted by Sir Richard Temple as editor-proprietor for more than thirty years, has been transferred to the Royal Anthropological Institute and is being published by that body under the authority of its Council as from January 1. It will continue under the joint editorship of the present editors, Sir Richard Temple and Mr. S. M. Edwardes, with S. Krishnaswami Aiyangar as Indian editor. In policy and scope the *Indian Antiquary* will remain unchanged, and will continue to deal with the history, ethnology, archaeology, linguistics and folklore of India. The Council of the Royal Anthropological Institute has authorised the formation of an Indian Section of the Institute the function of which will be to afford a meeting-place for discussion among those in Great Britain who are interested in the anthropology, archaeology and history of India, to correlate the results of research in these subjects, and also to co-operate with workers in India. The *Indian Antiquary* will serve as the official publication of this Section and in it the proceedings of the Section will appear.

PROF. BOHUSLAV BRAUNER, professor of chemistry in the Charles' (Bohemian) University at Prague, has been awarded the cross of a chevalier of the French Légion d'Honneur for his scientific work in chemistry.

DR. ALEXANDER WETMORE, of the U.S. Biological Survey, has been appointed superintendent of the National Zoological Park, Smithsonian Institution, Washington, in succession to Mr. N. Hollister, who died on November 3.

THE Tokyo correspondent of the *Times* announces that Mr. Rockefeller has made an unconditional gift of four million yen (400,000*l.* at par) to the Imperial University Library. It will be remembered that in the fire which followed the earthquake of September 1, 1923, the Library of some 700,000 volumes was destroyed.

WE have received the annual report and statement of accounts for 1923-24 of Livingstone College,

Leyton. The College was founded thirty-two years ago for the purpose of training missionaries in the elements of medicine, and 810 students have taken its courses of instruction during that period. The deficit has been reduced by about 42*l.* during the year, but it still amounts to 1067*l.*, and further donations and subscriptions will be very welcome.

ON Tuesday next, January 27, at a quarter past five, Dr. H. R. Hall will deliver the first of two lectures at the Royal Institution on the relations of the prehistoric Greek and ancient Egyptian civilisations, and on Thursday, at the same hour, Sir William Bragg will begin a course of four lectures on the properties and structures of quartz. The Friday evening discourse on January 30 will be delivered by Prof. J. W. Gregory on the mountain structure and geographical relations of South-eastern Asia, and on February 6 by Prof. R. W. Chambers on the earliest recorded kings of the English.

THE first presentation of the Rivers Memorial Medal for anthropological work in the field, founded by the Council of the Royal Anthropological Institute in memory of the late Dr. W. R. Rivers, will be made at the anniversary meeting of the Institute to be held at the London School of Economics on January 27, at 8.30. As already announced, the first award of the medal has been made to Dr. A. C. Haddon, in recognition of his work in New Guinea, Torres Straits, and Borneo. After the presentation, Prof. C. G. Seligman, president of the Institute, will deliver his presidential address on "Some Little-known Tribes of the Southern Sudan."

IN connexion with the recent celebration of the bicentenary of Sir Christopher Wren, the Royal Institute of British Architects published a book on Wren and his work (including St. Paul's Cathedral), entitled "Sir Christopher Wren Memorial Volume: 1723-1923." The profits of the sale are devoted to the St. Paul's Preservation Fund. The sale of only one thousand copies of the five guineas edition would enable the Institute to hand over a sum of 2000 guineas, which would be acknowledged in the *Times* list in the name of each purchaser as a subscriber of two guineas. Orders, enclosing remittance, should be sent to the Librarian, R.I.B.A., 9 Conduit Street, London, W.1.

A PROCESS of direct colour photography is recorded by A. Hoffmann (*Photographic Abstracts*, iv. 139), who found that when photographing on a chloro-bromide transparency plate, objects reflected from the surface of a lake were rendered in their natural colours on prolonged development with pyrogallic acid. The angle of reflection proved to be the polarising angle. The author found that by using a grainless emulsion of Valenta's formula and exposing with a black glass reflector in front of the lens, on development with 0.1 per cent. pyrogallic acid with relatively large proportions of ammonia and potassium bromide, images in very good natural colours were produced.

AN investigator at the mines department testing station at Eskmeals, Cumberland, is shortly to be appointed, and applications for the post are invited.

The duties of the person appointed will be to carry out, under the direction of the superintending testing officer, experimental work on problems arising in the testing of safety lamps (flame and electric), the analysis of mine air and mine dust, etc.; and to assist the testing officer generally in carrying on the scientific work of the station. Applicants must possess good scientific qualifications and have had experience in analytical and experimental work of this character. Forms of application, which must be returned not later than January 31, can be obtained from the Under-Secretary for Mines, Establishment Branch, Mines Department, Dean Stanley Street, S.W.1.

THE Scientific Expeditionary Research Association dispatched the *St. George* last April on a year's cruise to the Southern Pacific with the object of exploring many of the lesser-known islands and reporting on their natural history, ethnology, botany, marine life, etc. An account of the work which has been accomplished was given in our issue of November 8, 1924, p. 681, by Mr. J. Hornell, the scientific director of the expedition. It was intended to complete the cruise by studying the little-known islands south and east of Tahiti; but owing to unforeseeable circumstances, the funds are no longer available. Unless about 9000*l.* can be raised at once, it will be necessary to recall the *St. George* at what will be the most valuable and promising point of her voyage. An appeal has accordingly been issued, signed by ten members of the Advisory Council, representative of various branches of natural science, archaeology, and so on, six of whom are fellows of the Royal Society. Subscriptions should be sent to the secretary of the Association at 50 Pall Mall, S.W.1.

THE work of the Smoke Abatement League of Great Britain, established in 1909, was dropped during the War and was not taken up again until 1923. Now the League is preparing a great campaign against the smoke nuisance and, with this object in view, is appealing for increased membership and support. We learn also that the valuable papers which were presented at the Manchester Smoke Abatement Conference held in November last under the auspices of the League, together with the discussions, are to be issued shortly in book form. Particulars of the League's activities can be obtained from the honorary secretary, Mr. C. Elliott, 33 Blackfriars Street, Manchester.

A VERY interesting and instructive catalogue (pp. iv+24) of industrial sands has recently been issued from the Westmoor Laboratory, Chatteris, by Mr. A. L. Curtis, who for twenty years has specialised in supplying tested sands, and also clays and refractories, for technical and commercial use. It will be a revelation to many that the particular requirements of manufacturers and contractors can be met by so many different kinds of natural and artificially-prepared sands. The pamphlet describes more than fifty varieties used for widely different industrial purposes such as glass and pottery manufacture, sand-blast and other abrasive processes, moulding and casting, furnace lining, filtering, cement making

and testing, and less familiar applications in the soap and paint industries. Mr. Curtis has accumulated an enormous mass of data relating to the properties and uses of sands, and he undertakes to advise his clients on the problems that arise. Apart from his commercial enterprise, he is to be congratulated on issuing a pamphlet of unusual educational interest.

THE fourth Annual Report of the Animal Breeding Research Department of the University of Edinburgh is a record of research work actively pursued in many directions under the guidance of the director, Dr. F. A. E. Crew. The Department is engaged on the problem of wool improvement in Welsh sheep, with special reference to its kemp content, with the object eventually of eliminating this undesirable element from the fleece. Hybridisation experiments by crosses with Peruvian merino sheep are also being carried out with the object of improving British wools, and this has necessitated a detailed microbiological investigation of the fibres comprising the fleece of sheep. Parallel investigations on the fecundity, fertility, sterility, and general physiology of fertilisation in sheep are in progress and promise results of great importance. The list of twenty-one papers issued from the Department in the course of the nine months covered by the report is an eloquent witness to its widespread activities and to the value of the work being carried on there.

WE are informed that Messrs. Gurney and Jackson, 33 Paternoster Row, have been appointed official publishers to the Faraday Society, and in future they will deal with all business relating to the sale of Transactions and separate Reports of General Discussions.

WE have received from Messrs. Negretti and Zambra a specimen of an ingenious and simple pocket forecaster. The instrument consists of three concentric circular discs, the largest of which is two inches in diameter. The instrument is set by first rotating the middle disc so as to bring an arrow on it into coincidence with the appropriate point on a wind direction scale engraved on the outer disc, and then rotating the inner disc so as to set an arrow over the appropriate reading of a barometer scale in inches graduated on the middle disc. The inner disc has three windows, one each for rising, steady, and falling barometer, fitting over a series of code letters A to Z. Through the appropriate window a code letter is read, and this letter selects one of 26 forecasts given on the back of the outer disc. The instrument is ingeniously conceived, and can be recommended to those who desire to make the most of their barometer, with the proviso that no simple instrument can be expected to be infallible in dealing with so complex a phenomenon as the weather. On the whole, it may be expected to give good results.

### Our Astronomical Column.

WOLF'S COMET.—A Copenhagen telegram announces that Prof. Wolf succeeded in photographing this very faint comet again on January 13, at 17<sup>h</sup> 58<sup>m</sup> 5<sup>s</sup> G.M.T. (new), its position for 1925.0 being R.A. 4<sup>h</sup> 4<sup>m</sup> 48.0<sup>s</sup>, N. Decl. 20° 14' 54". The Right Ascension was about 1<sup>m</sup> 27<sup>s</sup> less than Kahrstedt's ephemeris, the Decl. 12' greater. The orbit elements therefore need considerable modification, but there has not yet been time to do this. The magnitude had declined from 16 to 17, so it is to be feared that the object will not be visible for very long.

MINOR PLANETS.—*Astr. Nachr.*, No. 5341, contains a paper from the Berlin Recheninstitut describing the discovery of minor planets for the period July 1, 1923, to June 30, 1924. The number of discoveries is unusually large, 108, and shows that we are far from exhausting the zone. Only 29 of these were sufficiently observed for trustworthy orbits to be calculated and to receive permanent numbers. The numbers assigned are 996 to 1024, so that the 1000 mark is now well passed. No. 1023 is named Thomana; the others are still unnamed. The highest inclination among the new planets is 26° 58' (No. 1019), the lowest 0° 41' (No. 996). The greatest eccentricity is 0.454 (No. 1009), the smallest 0.009 (No. 1020). The periods range from 2.64 years (No. 1019) to 6.25 years (No. 1004). A new plan for the provisional numeration of planets is adopted in the new year. The lettering will begin afresh each year: planets discovered in the first half of January will be denoted by AA, AB, AC . . . ; in the second half BA, BB, BC . . . , in first half February CA, CB, CC . . . , the first letter changing twice a month. The system permits the insertion of planets afterwards detected on plates.

The year must be prefixed to the letters, but in practice the last two digits of the year will suffice. This system will put an end to the present diversity, three independent systems having been in vogue since the War.

STELLAR SPECTROPHOTOMETRY.—*Bull. Astron.* tome iv. fasc. iii. contains an interesting research by M. Jules Baillaud on the distribution of energy in the spectra of stars of types A and B, also of Procyon (type F5). The observations were made at the observatory on the summit of the Pic du Midi (altitude 9384 feet). The curve for Procyon had a maximum at  $\lambda 425$ , and resembled that of a black body at a temperature of 7000°. The curves for types A, B do not resemble those of a black body at any temperature. They fall off much more rapidly from their maximum. For type A this occurs in the neighbourhood of  $\lambda 400$ , for type B it is at a wave-length even shorter than  $\lambda 330$ , which is the limit to which the spectra were studied. The descent from this point is even more rapid than that indicated by Planck's formula for temperature 100,000°. The author concludes that the spectrum of stars of type B arises from the radiation of ionised atoms. He compares the continuous spectrum given by metallic vapours in an arc in vacuo, as observed by M. St. Procopiu.

$\alpha$  Cygni, though of type A, resembles  $\beta$  Orionis closely for the longer wave-lengths but not in the ultra-violet.

Two of the stars included here,  $\gamma$  Cassiopeiæ and  $\alpha$  Cygni, were also studied by Plaskett. Baillaud's curve is much higher in the ultra-violet, perhaps owing to diminished atmospheric absorption. He determined the correction for this by observing the same star at different altitudes.