

and the hunt for oil, now aided by torsion balance work, pursued. If success follows, there is avoided that scramble for the oil field which has so often in the past involved loss due to hasty and wasteful boring and pumping, and violent fluctuations in supply and cost.

To sum up: geophysical methods wisely used can be helpful and profitable. If the possibilities are over-stated or improper claims made, there will be a lack of confidence retarding that advancement which careful development should achieve.

News and Views.

THE discovery in the United States in 1922 by T. Midgley that lead tetra ethyl has a remarkable action in delaying detonation or 'knocking' in the internal combustion engine when added to petrol in minute amounts, has brought this organo-metallic derivative from the obscurity in which it had remained since it was first prepared and described in Great Britain by Buckton nearly seventy years ago (*Phil. Trans.*, **149**, 431) to be an important article of commerce. It is an oily colourless liquid, density 1.66; of boiling point above 200° C., with decomposition. It possesses toxic properties which are specific in character and differ from ordinary lead poisoning in that the first symptoms are insomnia and fall in blood pressure. The oil is slightly volatile and can be absorbed through the skin. Attention has been directed recently by eminent chemists to these poison dangers which might occur with the indiscriminate use of petrol containing small amounts of lead tetra ethyl, and on Feb. 29 in the House of Lords it was announced that an Interdepartmental Committee is to be appointed forthwith consisting of representatives of the Ministry of Health, the Home Office, and the Medical Research Council, to investigate the poison hazard associated with the sale of ethyl petrol in Great Britain.

In 1924, at an experimental plant in New Jersey, where the manufacture of pure lead tetra ethyl was being carried out, a number of serious poison cases occurred, and the newspaper publicity which followed led to a voluntary suspension of the sale of ethyl petrol in the United States until the poison hazard had been investigated by the Surgeon-General of the U.S. Public Health Service. It was recognised that the manufacture and handling of lead tetra ethyl is attended with danger if not done with proper precautions, but the debatable points were the hazards to retail distributors, garage employees, and the individual users of ethyl petrol in which the lead compound is diluted by about one part in 1300. After elaborate and careful investigations, it was concluded by the Surgeon-General that no poison hazard could be traced to the use of ethyl petrol, and the manufacture of lead tetra ethyl was resumed on June 1, 1926. Researches in the direction of finding other substances of a non-poisonous character and equally as efficacious as lead tetra ethyl, have up to the present been without success, although iron carbonyl is used to some extent in Germany, so that unless a grave and well-established hazard exists, the abandonment of the use of lead tetra ethyl does not appear to be justified.

It is, perhaps, little appreciated in Great Britain that the present low price of sugar has placed British

Colonies which supply us with this commodity in a distinctly precarious position; and it is not generally recognised how vital a matter Imperial preference is to some of the British West Indies, Mauritius, Demerara, and Fiji. There are two main factors concerned, one economic and one scientific; and the latter is the general low level of research work in our cane plantations. The almost universal aim in progressive cane-sugar countries is to induce the plant to produce more tons of sugar to the acre; for this purpose men versed in scientific methods have been enlisted. It must be confessed, however, that the British Colonies are very much behindhand in this respect. A short article in the current issue of the *International Sugar Journal*, under the heading "Scientific Work in the Plantations," deals with this matter, using as a text the action of the Oahu Plantation Company in the Hawaiian Islands, when faced with the serious situation caused by the trade slump following the boom year of 1920. In January 1921 this company founded a "Department of Agricultural Research and Control," and the results thus far obtained by its scientific officers on one single programme of work, namely, the proper feeding of the cane with artificials, are briefly summarised. Astonishing success has attended the application of scientific research to the fields for this purpose; and it is claimed that if in the factory a piece of machinery were invented giving equal financial results, it could be capitalised at one million dollars. So it would seem that such an investment in research is a paying proposition.

THE quarterly report of the Empire Cotton Growing Corporation, issued on Feb. 9, clearly indicates the extent to which this body is involved in the present serious crisis in the Lancashire cotton industry. The purpose of the Corporation was described and discussed in our issue of Nov. 5, p. 645. Briefly, its income is, in the main, obtained from a levy of 6d. per bale of cotton entering England; and its aim is to enable British buyers to control this raw material, by increasing the amount grown within the Empire. The Act legalising the levy expires in July next, and representative bodies have been sounded as to the attitude likely to be taken up by the trade when the question comes before Parliament during the present session. The result of this inquiry appears to be that, while fully appreciating the work that the Corporation has been able to accomplish, it is unlikely that the spinners will agree to the continuance of the levy, at any rate at the present figure.

THE position of the cotton industry has, indeed, become so precarious that drastic retrenchment in every possible direction has become a vital necessity,

and, as is so often the case, the reduction of research is considered a possible economy. The only hope is that the industry will consent to a reduced levy. If this is denied, the Corporation may have to close down—a contingency not only adverse to Lancashire, but also to most of the cotton growing dependencies of Great Britain. Lord Derby, in presenting the report of the executive committee, directed attention to some of the progress which has recently been made, and issued a powerful appeal to the Lancashire cotton trade to support the fresh Bill about to be introduced. The work of the Corporation is both economic and scientific; and one instance of marked scientific success is the result of plant-breeding work, which has cleared away the main hindrance to cotton growing in the important cotton tract of the Union of South Africa.

THE committee appointed on Jan. 16 by the conference of Thames riverside authorities in connexion with the floods in the London area of Jan. 6-7, presented on Feb 29 a unanimous and authoritative report. A technical sub-committee, which examined the hydrographic, meteorological, and hydraulic questions involved, reported that on the information at present available, more could not be said in explanation of the tide of Jan. 6-7 than that it was due to a combination of a spring tide, not in itself exceptional, the raising of the water in the estuary by the meteorological conditions of the North Sea, and by flood waters from the upper Thames. On the question of future probabilities, it was reported that the whole subject of tides in the Thames requires further expert investigation, and it is recommended that this investigation should be undertaken by the Tidal Institute of the University of Liverpool, in co-operation with the Hydrographic Department of the Admiralty and the Meteorological Office. A scheme of warnings of the possibility of storm-floods was drawn up and recommended by the committee, subject to any improvements which the report of the special investigation on tides may suggest. The main points of this scheme are the following: (1) Public announcement to be made by the Meteorological Office, after consultation with the Port of London Authority, should climatic and tidal conditions be such that exceptionally high tides may be expected. This is an initial precaution. (2) Special watch to be kept at Southend, and, should the tide reach a specified high point, warning to be given to the appropriate authorities. (3) Watch then to be kept at selected points, and public warning to be given in the locality if the water reaches danger level, the London County Council to specify the danger level at each point and the locality to be warned.

MUCH interesting historical information on exceptional high waters in the Thames is set out in the Committee's report, and it is concluded that on the basis of records alone, there was no reason to expect a tide of the magnitude of that of Jan. 6-7. So exceptional was this recent storm-flood that its high water was eleven inches above the highest previously

recorded, namely, that of Jan. 18, 1881. The Committee shows that whereas during the last thirty years the yearly average height of high waters at Crossness, on the seawards border of London, has remained steady, the corresponding average at Hammersmith has shown a small but continuous upward trend. The phenomenon at Hammersmith is probably to be attributed to the dredging and other changes which have been made in the bed and sides of the river, but the Committee quite properly points out that what is important for flood-works is not average high-water levels, but what may be expected in the way of exceptionally high tides.

LITTLE progress appears to have been made as yet in the discovery of principles which will enable storm-floods to be forecast from a knowledge of meteorological conditions. From noon until midnight on Jan. 6, there was a north-westerly gale over the North Sea and a westerly gale over the English Channel. On the other hand, the flood of Jan. 18, 1881, was preceded by a south-easterly gale which changed to easterly and then to north-easterly. The floods which occurred on the eastern shores of the North Sea in January 1916 have been studied by L. Grossmann, of the Deutsche Seewarte, and by D. la Cour, of the Danske Meteorologiske Institut. Those which occurred on the coast of Flanders during the German occupancy have been studied by Bruno Schulz, of the Deutsche Seewarte. More progress has been made in correlating with meteorological conditions those much smaller but fairly steady changes in sea-level which are almost invariably present in addition to the regular tides. In recent years important contributions to this subject have been made by R. Witting of the Helsingfors Havsforskningsinstitut for the Baltic and by A. T. Doodson of the Liverpool Tidal Institute for British waters. It has been shown by the latter that it is possible at present to forecast about half of these non-storm effects, providing that one is supplied with a substantially accurate forecast of the distribution of atmospheric pressure.

HALF a century has been spent by the Institute of Chemistry of Great Britain and Ireland in increasingly effective service to the community as well as to the profession, and the intention of its members to continue vigorously in the same service is apparent. At the fiftieth annual general meeting, held on Mar. 1, in the unavoidable absence of the president, Prof. A. Smithells, Mr. E. R. Bolton, vice-president, read the presidential address, in which the importance of the continued loyal co-operation of all the members in this direction was emphasised. The membership has increased during the past year by 202, the roll of fellows and associates now totalling 5388. The associateship is a recognition not only of competence but also of personal acceptability; adherence to the code of professional ethics, moreover, is a sign of a definite orientation towards the highest ideals of the professional man. The determination to keep Great Britain in a leading position in chemical industry, evident in recent developments among our greatest

manufacturing concerns, has created an unprecedented stir in centres of chemical education; the address referred to the desirability of convening a conference to consider generally the education of the chemist. It has been a function of the Institute to make representations to public authorities whenever it has appeared that there was inadequate understanding of the aims of, or of the responsibility involved in, the work carried out by professional chemists, and to protest when mean conditions of service have been offered. The existence of local sections of the Institute in the principal centres throughout the country has enriched the corporate life of the profession. Prof. A. Smithells was re-elected president for the new session.

BENJAMIN LEIGH SMITH, Arctic explorer, was born on Mar. 12, 1828, and the centenary of his birth deserves recognition for his disinterested and courageous efforts to add to Arctic geography. He graduated at Jesus College, Cambridge, attaining a high place in the Mathematical Tripos. Proceeding to the bar, he was 'called' at the Inner Temple in 1856. He lived a long span, dying in 1913, aged eighty-five years. Leigh Smith made in all five voyages to the Arctic regions. The first, carried through in 1871, in the *Samson*, was directed to exploration north-east of Spitsbergen. Two further voyages were similarly devoted to the Spitsbergen zone. In these he combined the attainments of a scientific observer with the skill of an experienced navigator, whilst both were coupled with that sense of enthusiasm which is indispensable to the pioneer. In the winter of 1880, Leigh Smith built a steam vessel at Peterhead—the *Eira*—of 360 tons burden, and 123 feet long by 25 feet beam. She had a complement of twenty-five, and was intended for a summer cruise in the vicinity of Franz-Josef Land. Much was accomplished before disaster overtook the expedition. The *Eira* was crushed in the ice on Aug. 31, 1881, and sank. The crew built a hut of turf and stones and wintered, along with their leader, living for the most part on walrus and bears. In June following they left in boats, reaching Novaya Zemlya, where relief was available. At the anniversary meeting of the Royal Geographical Society in 1881, the Patron's Gold Medal was awarded to Leigh Smith on the grounds (announced by Mr. C. R. Markham) that he had made important discoveries along the south coast of Franz-Josef Land, establishing new starting points for polar research; and for previous geographical work in the Arctic regions, all of which had been carried out entirely at his own expense and were personally directed. There is a portrait of Smith in the National Portrait Gallery, by Stephen Pearce.

AN interesting glimpse of primitive Europe still surviving is afforded by the story of the career and death of Samuele Stocchino, quoted from the *Corriere della Sera* by the *Times* on Feb. 27. Stocchino was the terror of Nuoro, the wildest province of Sardinia, and is known to have killed eleven men in vendetta besides having committed many minor outrages. He

was thirty-two years of age, and the son of a brigand who was sentenced to twenty years' penal servitude. Stocchino behaved with conspicuous bravery during the War, but at its termination took to the mountains to carry on his vendettas. He has now been shot by the carabinieri after a hunt lasting for eight years. He was finally caught in an ambush, and for some time his body lay where it fell beneath a tree. His relations, belonging to eleven families, all dressed in black, filed past it in procession, each touching the left foot of the body in passing, it being the popular belief that by so doing the doom overhanging the family was averted. Pieces of the brigand's clothes were distributed to serve as amulets. Finally, the population of Nuoro sprinkled salt and dry olives on the threshold of the 'cursed' house where the brigand was born as a propitiatory rite. The use of salt as a protection against evil influences is interesting. It will perhaps be remembered that in a matrimonial case heard a year or so ago in Devonshire, one of the grounds of complaint by the husband was that his wife, believing him to have bewitched their child, always sprinkled salt around his chair.

MR. A. J. B. WACE communicates to the *Times* of Feb. 27 an account by Prof. Persson of the excavations of the Swedish Expedition in Greece at Dendra, at the foot of the Mycenæan citadel of Midea, in Argolis. A cemetery of important rock-cut chamber tombs has been excavated, two of them being found to contain funerary offerings such as are usual in better-class tombs of this type and dating from the latter end of the fourteenth century B.C. A third tomb was of unusual size and was immediately apparent to be out of the common. The entrance passage, hewn out of the rock, is 60 ft. long and 6 ft. wide. On its floor, which lies 17 ft. below the surface, was a mass of stones from the wall barring access to the door, and under this lay a female skeleton, accompanied by a long bronze pin, spindle whorl, and ornaments in glass paste once masked with gold leaf, which had been left by plunderers of Mycenæan times. In the chamber under two great stone slabs was found a collection of thirty-three bronzes packed one within the other, and brilliantly patinated in green, blue, and brown. These included six large jugs, seven bowls, four tripods, five lamps, a six-pronged fish-spear, a sword, two knives, and two razors. Several are decorated with delicately engraved flowers or shell-fish, others with geometrical patterns. Many of the objects retain their wooden handles.

THIS find is one of the richest of early bronzes yet made in Greece. It has been possible to fit together some of the many fragments of limestone on the floor. They have proved to be a sacrificial stone, and further apparatus of sacrifice, of which other evidence appears in traces of smoke on the walls and a quantity of charcoal. On the floor was a bronze sword with a hilt ornamented with glass beads in hundreds, boars' tusks cut and pierced to sew on a leather helmet, an iron stud from a sword hilt, and hundreds of small

(Continued on p. 393.)

ornaments in glass paste. Finally, small beads of glass paste lying in masses show a pattern worked in colours, probably part of a garment, a new feature in Mycenaean art. Pottery dates the tomb at about 1300 B.C. No human remains were found, and Prof. Persson suggests that the tomb may have been the cenotaph of a chief. This would agree with the great attention known to have been paid to the dead by the Mycenaeans and with practices suggested in several Homeric passages.

THE Boyden Station of the Harvard College Observatory, which was situated at Arequipa, Peru, from 1890 until 1927, has now been re-established near Bloemfontein in the Orange Free State. Photographic work with two telescopes was resumed in September 1927, using the temporary quarters provided by the city of Bloemfontein while the permanent station is under construction on a low kopje a short distance south of Mazel's Poort, the power station settlement of the city. Bloemfontein is providing the permanent site for the new observing station, and making roads and other improvements for the Harvard Observatory. Under the former director, Prof. E. C. Pickering, and the present director, Prof. Harlow Shapley, the Harvard Observatory has maintained for forty years a very active interest in the southern sky, and nearly one-half of the great collection of astrographic plates at Harvard were made at its Boyden Station. The observing conditions at Arequipa were excellent for about eight months of the year, but a prolonged cloudy season from November to March badly hampered the systematic observations. The cloudy weather at Bloemfontein is more evenly distributed through the year, and at the same time the transparency and seeing are extraordinarily good. The transfer of the station and its enlargement were made possible through gifts by the International Education Board and by Harvard University. A new 60-inch reflecting telescope, to be the largest instrument in operation in the southern hemisphere, is being constructed for the Boyden Station. Other instruments that will be in operation are photographic doublets of eight inches and twenty-four inches aperture, a 10-inch photographic triplet, the 13-inch Boyden refractor, and photographic cameras of one, three, and five inches aperture. The problems under investigation include extensive studies of variable stars, extra-galactic nebulae, globular star clusters, proper motions, and spectral classification and analysis. The transfer and erection of the station are under the immediate supervision of Dr. J. S. Paraskevopoulos.

THE *Annual Report* of the Committee of Management of the Lewis Evans Collection of Scientific Instruments at Oxford has just been published. It records the restoration of the main exhibition room in the Old Ashmolean Museum to its original condition, and the unveiling by Viscount Cave, as Chancellor of the University, of the memorial windows to Dr. Plot and to Sir Christopher Wren. All the astrolabes in the collection have now been photographed in preparation

for an illustrated catalogue; important memoirs on the subject of the astrolabe have been published by Dr. R. T. Gunther, the curator of the collection. Among recent accessions are a 6-in. reflecting telescope made by Sir William Herschel, and the fine silver microscope made by G. Adams for George III. The telescope has been presented by Dr. Herbert N. Evans, of Exeter College, himself a cousin of Dr. Lewis Evans; it was formerly in the possession of Archdeacon Nathaniel Jennings, who had a small private observatory on the north side of Regent's Park, London. The George III. microscope, apart from its interest as an example of the silversmith's art, admirably illustrates the advance made in one century from the instrument designed by R. Hooke, of Christ Church, in 1665. Among other accessions are a 'thunderhouse' and a frictional electric machine, both of which are associated with Joseph Priestley. The Report ends with a reference to the finances of the collection, which in spite of liberal gifts from the great City Companies and other public bodies both within and without the University, cannot yet be said to be on a satisfactory footing.

PROF. A. LABBÉ's work on copepods in the saline waters of Croisic, and his claims to have established an evolution from one genus to another, have been discussed by Mr. R. Gurney and Mr. A. G. Lowndes in the columns of NATURE (Sept. 4, Oct. 16, 1926; Aug. 27, 1927). These 'allomorphs,' or transition forms, he affirms may be produced by slight alteration in the environment, both in the laboratory or, within a longer period, naturally in the marshes themselves. Thus in eight stages, during seven years he claims to have transformed *Canthocamptus* into *Cyclops*, and similarly many forms have been changed from one genus to another. Mr. Gurney's criticisms are based, first, on the incomplete evidence given, Prof. Labbé himself admitting that his aquaria were not absolutely free from contamination by other species, and giving no exact details of his experiments so that the evidence can be weighed; and secondly, on the wrong identification of his forms, some of the new genera being apparently identical with those already known, and the figures themselves inaccurate. Mr. Lowndes attacks the problem from another quarter, questioning the results on the grounds of the impossibility of such small increases in the pH being capable of producing such momentous results, and referring to his own work on freshwater *Cyclops* which retain their individual characters within a wide pH range.

WE have now a communication from Prof. Labbé in support of his own observations, upholding the identifications in spite of criticisms, his contention being that Mr. Gurney could not possibly prove that forms were identical which he did not see. He suggests sending to Mr. Gurney a lot of the copepods for analysis; an offer which we hope will be accepted. Secondly, in answer to Mr. Lowndes he agrees that freshwater copepods can often bear a much greater range of pH than those in salt water, but holds that variation in pH will not necessarily bring about morphological variation. Thus the quoted *Artemia*

showed no change, whatever the variation in pH. On the other hand, with small change in surroundings alteration may take place. As he says, "Allelogenesis is likely to succeed only under proper conditions of equilibrium between inner and outer pH." To find such conditions "is the fundamental problem of allelogenesis, which I have not yet solved." Prof. Labbé quotes his previous work on the cycles of *Dunaliella* as suggesting some solution of the problem of internal adjustment, and finally states that he will carry on his researches 'quite undisturbed.' It is to be hoped that he will bring forward more exact descriptive and experimental evidence in support of his interesting and revolutionary statements.

WE much regret to announce the death on Mar. 4, at the age of seventy-five years, of Sir Aubrey Strahan, K.B.E., F.R.S., lately Director of the Geological Survey of Great Britain, and of the Museum of Practical Geology, London.

THE Council of the British Association will nominate Sir Thomas Holland, rector of the Imperial College of Science and Technology, as president of the Association for the meeting to be held in South Africa in July and August 1929. Mr. O. J. R. Howarth, Secretary of the Association, expects to proceed to South Africa in May next to confer with authorities there on arrangements for the meeting.

MR. W. L. HICHENS, chairman of Messrs. Cammell, Laird and Co., and well known for his work in scientific administration and industry, has been elected a member of the Athenæum Club under Rule II., which provides for election by the Committee of "persons of distinguished eminence in science, literature, or the arts, or for public services."

THE following officers were elected at the annual general meeting of the Geological Society of London, held on Feb. 17: *President*, Prof. J. W. Gregory; *Vice-Presidents*, Dr. F. A. Bather, Prof. E. J. Garwood, Dr. E. Greenly, and Mr. H. W. Monckton; *Secretaries*, Mr. W. Campbell Smith and Dr. J. A. Douglas; *Foreign Secretary*, Sir Arthur Smith Woodward; *Treasurer*, Mr. R. S. Herries.

DR. W. ROSENHAIN, Superintendent of the Metallurgy Department of the National Physical Laboratory, Teddington, since 1906, has been elected president of the Institute of Metals for 1928-29. Dr. Rosenhain is a graduate of the University of Melbourne, Australia, whence he came to England in 1892 with a research scholarship of the Commissioners of the 1851 Exhibition. He has carried out a large amount of metallurgical research both on non-ferrous metals and on iron and steel, and is also well known in connexion with glass technology.

DR. HERBERT E. IVES, who recently received the John Scott medal and premium for his contributions to electrical telephotography and television, has given the amount of the premium (1000 dollars) to the Optical Society of America, to found and endow a medal. This medal, to be awarded every two years for distinguished work in optics, is to be named "The Frederic Ives Medal," in honour of the donor's father.

A CONFERENCE on "Malting Barley" will be held at the Rothamsted Experimental Station at 11.30, on Thursday, Mar. 15. The subjects of the addresses to be delivered are "What the Barley Buyers Want"; "The Influence of Season on the Yield and Quality of Barley"; "Cultivation and Treatment of Barley grown for Malting in the Vale of Taunton"; "Cultivation and Treatment of Barley grown for Malting on the Lincolnshire Heath"; "Malting Barley: Old and New Varieties"; and "Five Years' Experiments on Malting Barley."

AT a meeting of the Royal Society of Edinburgh held on Mar. 5, the following were elected fellows of the Society: Dr. E. A. Baker (Edinburgh), Prof. G. B. Barbour (Peking), Mr. H. W. Brown (Edinburgh), Rev. Dr. W. S. Bruce (Banff), Prof. A. J. Clark (Edinburgh), Dr. A. Couttie (Edinburgh), Dr. W. Murdoch Cumming (Glasgow), Mr. W. R. Dawson (London), Mr. E. W. Fenton (Edinburgh), Dr. James Forrest (Dundee), Prof. J. Fraser (Edinburgh), Dr. K. Fraser (Carlisle), Mr. W. G. Harding (Oxford), Mr. A. D. Hobson (Edinburgh), Mr. W. V. D. Hodge (Bristol), Dr. A. Hunter (New York), Mr. P. J. Johnston-Saint (London), Prof. R. W. Johnstone (Edinburgh), Dr. T. J. Jones (Liverpool), Mr. T. L. MacDonald (Glasgow), Prof. T. J. Mackie (Edinburgh), Prof. G. Matthai (Lahore), Dr. J. E. Nichols (Edinburgh), Dr. C. H. O'Donoghue (Edinburgh), Dr. G. H. Percival (Edinburgh), Mr. R. S. Pilcher (Edinburgh), Mr. C. E. Price (Edinburgh), Mr. O. F. T. Roberts (Aberdeen), Mr. R. Senior-White (Kasauli, India), Mr. A. D. B. Smith (Edinburgh), Mr. A. M. Watters (Hawick), Mr. J. M. Whittaker (Edinburgh), Dr. J. Williamson (St. Andrews).

THE fifth International Botanical Congress will be held at Cambridge on Aug. 16-23, 1930, with excursions during the following week. As at present arranged, the Congress will be organised in the following sections: Palaeobotany, morphology (including anatomy), taxonomy and nomenclature, plant geography and ecology, genetics and cytology, plant physiology, mycology and plant pathology. For each of these sections a British sub-committee has been appointed, by which the programme will be arranged. The chairmen of these sub-committees and their addresses are as follows: Palaeobotany, Prof. A. C. Seward, Botany School, Cambridge; morphology (including anatomy), Prof. F. E. Fritsch, Danesmount, Tower Hill, Dorking, Surrey; taxonomy and nomenclature, Dr. A. W. Hill, Royal Botanic Gardens, Kew, Surrey; plant geography and ecology, Prof. A. G. Tansley, Department of Botany, The University, Oxford; genetics and cytology, Sir John Farmer, Imperial College of Science and Technology, London, S.W.7; plant physiology, Dr. F. F. Blackman, Botany School, Cambridge; mycology and plant pathology, Dr. E. J. Butler, Imperial Bureau of Mycology, 17 Kew Green, Kew, Surrey. Communications made to the Congress by means of papers or by participation in the general discussions will be permissible in English, French, or German. An executive committee of British botanists has been appointed, with Prof. Seward as chairman,

to make the necessary arrangements; Dr. A. B. Rendle is acting as honorary treasurer, and Mr. F. T. Brooks, 31 Tenison Avenue, Cambridge, and Dr. T. F. Chipp, Royal Botanic Gardens, Kew, are honorary secretaries of the Congress.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—A teacher of woodwork and geometry at the Walthamstow Technical College—The Clerk to the Governors, 1 Selbourne Road, E.17 (Mar. 12). An assistant master for mathematics and science at the Acton and Chiswick Polytechnic Junior Technical School—The Principal, The Polytechnic, Bath Road, Chiswick, W.4 (Mar. 16). A principal and head of the metallurgical department of the County Technical College, Wednesbury—The Director of Education, County Education Offices, Stafford (Mar. 23). A full-time teacher of engineering subjects at the Shrewsbury Technical College—The Secretary to the Committee of Management, Guildhall, Shrewsbury (Mar. 27). A biochemist and a proto-

zoologist at the Medical Research Institute in Nigeria—The Private Secretary (Appointments), Colonial Office, 2 Richmond Terrace, Whitehall, S.W.1 (Mar. 31). Inspectors of agriculture under the Department of Agriculture and Forests of the Sudan Government—The Controller, Sudan Government, London Official, Wellington House, Buckingham Gate, S.W.1 (April 7). A professor of organic chemistry in the Central College, Bangalore, University of Mysore—The Registrar, University of Mysore, Mysore, India (April 25). A junior assistant in the Research Department, Woolwich (under the directorate of Explosive Research)—The Chief Superintendent, Research Department, Woolwich, S.E.18.

ERRATUM.—In NATURE of Mar. 3, p. 315, col. 2, lines 20 and 24, it was stated that Prof. A. V. Hill had calculated that the Woolworth Building in New York could be climbed in eight seconds, and that it had been done in nine seconds. These times should be eight minutes and nine minutes respectively.

Our Astronomical Column.

COMETS.—After the discovery of Reinmuth's comet, an examination was made of earlier plates taken at Königstuhl, with the result that the following position of the comet was derived: Jan. 29-10757 U.T.; R.A. 9^h 23^m 35^s.6; N. Decl. 17° 41' 19"; from this position, combined with those of Feb. 22 and 25, Dr. A. C. D. Crommelin has derived the following elliptical orbit (the position for Feb. 22, on revision of measures, was given as 9^h 15^m 7^s.5, N. Decl. 21° 44' 55"):

| | |
|----------|-----------------------|
| T | 1928 Feb. 1-6502 U.T. |
| ω | 9° 26' 37" |
| Ω | 124 53 11 |
| i | 8 0 16 |
| ϕ | 30 2 13 |
| log a | 0.5701080 |
| log q | 0.2685923 |
| Period | 7.164106 years. |

The following ephemeris is for 0 h. U.T.:

| | R.A. | N. Decl. | log r . | log Δ . |
|--------|--|----------|-----------|----------------|
| Mar. 8 | 9 ^h 14 ^m 31 ^s | 23° 8' | 0.2748 | 9.9889 |
| 16 | 9 16 44 | 23 31 | 0.2778 | 0.0132 |
| 24 | 9 20 54 | 23 35 | 0.2814 | 0.0402 |

The orbit does not closely resemble that of any comet in the catalogues, but there is a distant resemblance to that of Denning's comet, 1894 I. It is of interest that the aphelion point of the above orbit lies close to the perihelion point of comet Schwassmann-Wachmann, and the two comets were close together in the middle of 1924, if the orbit of Reinmuth is near the truth; it represents within 2½" an observation made at Milan on Feb. 28.

Mr. James Young obtained a photograph of Encke's comet, Feb. 6.7708 U.T., from which he derives the following position: R.A. 22^h 49^m 54.5^s, N. Decl. 0° 18' 55". This gives Feb. 19.829 for the date of perihelion, which is 3 hours later than Matkiewicz's predicted date, Feb. 19.6984, rather an unexpectedly large discordance. The acceleration of this comet, which formerly attracted so much attention, seems to have completely died away. This renders it difficult to explain the acceleration by resisting

medium, as such a medium could scarcely have been present in the last century and absent now.

Mon. Not. Roy. Astro. Soc. for January contains reproductions of the drawings of Skjellerup's comet by Mr. Chidambara Aiyar on Dec. 15, when it was about 2° from the sun.

THE DRAYSON PARADOX.—This paradox had its sole basis in a carelessly written paragraph in Sir J. Herschel's "Outlines of Astronomy." It asserts that the pole of the equator moves around a centre that is 6° distant from the pole of the ecliptic, so that the obliquity varies between 23½° and 35½°; the ice-ages are asserted to have occurred at the epochs of maximum obliquity. Drayson also erroneously claimed that the proper motions of stars were merely an effect of this movement of the earth's axis.

The observational evidence against the Drayson theory, and its lack of a dynamical basis, have been frequently brought before the public during the last half-century, but it still claims adherents. Mr. A. H. Barley, its principal advocate, has recently brought out a pamphlet, "The Ice Age" (W. E. Baxter, Ltd., Lewes, Sussex), in which the old assertions of Drayson are repeated, and the further claim made that the very small errors in the predictions concerning the recent solar eclipse (spoken of as 'serious errors' in the pamphlet) were due to the non-acceptance of Drayson's views. The argument here is a repetition of that used by Mr. E. J. Stone in several papers between 1883 and 1892; he ascribed the errors of Hansen's lunar tables to a change in the ratio of mean to sidereal time, brought about by the substitution of new solar tables in the *Nautical Almanac*. He was correct in asserting that some such change took place, but he multiplied its effect by 365; Sir G. Airy showed in a letter to the *Observatory* in May 1883 that sidereal time, from the manner in which it was derived, could not be in error by the amount that Stone asserted.

Prof. de Sitter discussed the errors of the lunar tables in NATURE of Jan. 21, p. 99, and gave the evidence in favour of the conclusion that they are due to small variations in the earth's rate of rotation, not to changes in the direction of its axis.