

has also been arranged with Section I (Physiology) on the question, "In what Sense can we Speak of Primary Colours?" The various branches of psychology are well represented, experimental perhaps more strongly than usual. A visit has been arranged to Stoke Park Colony, where the director of medical services, Dr. R. J. A. Berry, will give a demonstration of scientific and clinical methods of diagnosis of mental deficiency and will discuss their applicability to child guidance and normal children.

#### BOTANY.

Dr. A. W. Hill, of the Royal Botanic Gardens, Kew, is president of Section K (Botany) of the Association for the Bristol meeting. The emphasis at present being laid upon original investigation in mycology and plant physiology is reflected in Section K by the preponderance of papers dealing with these aspects of botany, Monday morning being devoted to the former and Tuesday morning to the latter.

A joint discussion (with Section M) on "Mineral Nutrition in Plants" will occupy the major portion of Friday morning. The various aspects of the subject dealt with during the discussion will be summarised by Sir John Russell. An excursion to Long Ashton to study material illustrating some features of the problem will be made during the afternoon.

Among the distinguished foreign botanists proposing to attend are Prof. F. A. F. C. Went, of Utrecht, who is to read a paper on "Wegener's Theory and the Distribution of the Podostemaceæ"; Dr. W. V. J. Osterhout, of the Rockefeller Institute, who is to contribute to the discussion on mineral nutrition; and Prof. W. Goodspeed, of Berkeley, Cal., who is outlining the results of his experiments with X-rays and radium on the species of the genus *Nicotiana*—a choice of subject which should have a particular appeal to the citizens of Bristol.

A number of attractive excursions have been arranged by local botanists, these including a visit to Mr. C. Hiatt Baker's garden at Almondsbury, and to the Somerset peat moors.

#### EDUCATIONAL SCIENCE.

The president of Section L (Educational Science) is the Right Hon. Lord Eustace Percy, whose

presidential address will be entitled "A Policy of Higher Education". At the opening session of the section on Thursday, Sept. 4, papers will be given on "The Pre-School Child", by Miss Margaret Drummond (representing the Nursery School Association), Dr. J. A. Hadfield, and Dr. W. E. Blatz (Director of St. George's School of Child Study, Toronto).

Almost all one session will be devoted to "The Curricula of Central Modern and Senior Schools". Mr. W. A. Brockington will open with a general survey; Mr. J. A. White, Mr. H. T. Morgan, and Miss V. E. Carr Gordon will follow with papers dealing with the subject from the selective central school, the non-selective schools, and the modern girls' school points of view respectively. An interesting discussion will no doubt follow. The session will conclude with reports from sub-committees of the section dealing with training for overseas, the production and distribution of educational and documentary films, and the teaching of general science in schools, with special reference to the teaching of biology.

Another session will deal with formal training and disciplinary values in education. Dr. C. W. Kimmins will present the report of a sub-committee on formal training, and Sir Percy Nunn will read the first paper on "Disciplinary Value in Education", and will speak particularly with reference to "The Conception of Mental Discipline". Miss H. M. Wodehouse and Prof. F. A. Cavanagh will follow with papers on "Discernment of Disciplinary Values apart from Experiment" and "Some Further Practical Considerations". A final paper will be read by Dr. W. G. Sleight, and the discussion will be opened by Sir Richard Gregory.

For the final session the subject will be English and foreign ideas on method of education in relation to industry and commerce. Mr. Henderson Pringle and Sir Francis Goodenough are to deal with the subject mainly with reference to commerce; Dr. A. W. Richardson and Miss E. Webb Samuel will give papers dealing with the industrial aspect, and Mr. A. Abbott will conclude with a general paper on the whole question.

Afternoon visits to the local schools and the new Hospital School for Cripples at Winford are being arranged, and also a full day motor trip for the Saturday, during which Dauntsey School will be visited.

### News and Views.

VERY hearty congratulations are extended to Sir Howard Grubb, who celebrates his eighty-sixth birthday on Monday next, having been born on July 28, 1844. Sir Howard was educated privately and at Trinity College, Dublin. In most parts of the world where observatories exist one may be sure that he has had a leading and expert part in the preparation of their equipment of mirrors, objectives, and all the varied apparatus and machinery of the modern astronomical observatory. Particularly is this the case as regards many of the great astronomical observatories of America; here his resourceful ingenuity has long been acclaimed. He has published

many memoirs, chiefly through the medium of the Royal Dublin Society—among the earliest, "The Great Melbourne Telescope" (1870) and "On Clocks for Equatorial Telescopes" (1875). In 1896 he read a paper at the Royal Institution on "The Development of the Astronomical Telescope". In 1881 Sir Howard was the recipient of the Cunningham gold medal of the Royal Irish Academy, in recognition of work in the service of astronomers; in 1912 he received the Boyle medal of the Royal Dublin Society, awarded for scientific labours of outstanding merit carried out by Irishmen or in Ireland. Holding the honorary degree of master of engineering in the University of Dublin,



Sir Howard is also an honorary member of the Institution of Civil Engineers of Ireland. He was elected into the fellowship of the Royal Society of London so long ago as 1883.

DR. HERBERT LEVINSTEIN went fairly to the root of things in his presidential address to the Society of Chemical Industry delivered at Birmingham on July 15. "How we govern ourselves," he said, "how we arrange the exchange of our labour for goods or services, how we arrange our quarrels and our hates, social, racial, or international, all are merging into or depend on the greater problem of how we shall make the earth supply us with what we must have; how we can make the sun and the air do the maximum for us. This we may regard as one of the two great tasks of science. . . . The other problem of science is how to decrease human suffering by the conquest of disease." Hence the title of his address, "But an Apprentice in Nature's Workshop", and his remark that Aristotle's elements—earth, air, fire, and water—are the real raw materials of our organic chemical industries; hence also his statement that a striking weakness of Great Britain to-day as a manufacturing country is its dependence on coal as a source of power. We reckon wealth in terms of our store of fossils, but the age of coal is passing, and Dr. Levinstein suspects that the age of coal will take up but little space when the history of the world is written a few generations hence. "It will have lasted, when it is over, for a shorter period than the Moorish occupation of Spain." Other countries are developing the use of water power; we have little, but the problem of finding sources of energy alternative to a diminishing store of fossilised energy is none the less, rather the more, urgent.

An industrial nation must have cheap power; although the exhaustion of our coal supplies will concern our descendants more acutely than ourselves, we of the present generation are faced with the alarming fact that coal is now no longer the cheapest source of power, and consequently it is no longer suitable for the new and large, cheap power industries. One such industry, that which produces aluminium, possesses the only outstanding hydro-electric installation in Great Britain; this will eventually represent about 840,000 tons of coal annually. We must therefore look for some other source of power. Politics must of necessity enter into the examination of such questions as are discussed by Dr. Levinstein. They can scarcely be considered along traditional lines, for tradition is a poor weapon with which to slay new and unmistakably fiery dragons. Familiar points of view may indeed prove sufficiently well placed to envisage the new domain of industry, but probably they will not, and the whole political side of the matter will have to be examined anew and 'without prejudice'. It is therefore only just that we should refer briefly to some considerations which Dr. Levinstein lays before our legislators.

THE business of Great Britain, as seen by the 'Manchester school' of economists, is to import raw material and food and to export manufactures; the main principle is to buy in the cheapest and sell in the

dearest market. This, said Dr. Levinstein, is the "principle of the cheapjack"; to buy in the most trustworthy and sell in the most permanent market is a better maxim. He would therefore buy food and timber from those who buy our manufactures. There is at present a world over-production of manufactured articles which is likely to be permanent, whilst the over-production of food and wood is certainly temporary; when it passes, the opportunity for making arrangements for mutual interest between Great Britain and those sparsely populated nations which own wide areas of food and forest lands may pass with it. Further, Dr. Levinstein stresses the fundamental importance of the proper utilisation of the land in a densely populated country where land is relatively scarce. Let us decide, he urges, what proportion we should have under grass and then ensure that every acre, whether grassland or arable land, is compelled to yield the maximum of nourishment for the people. By the application to pasture of intensive methods, seventy million pounds could be added to the annual value of our milk and meat production; this is more than double the value of imported American cotton, and its magnitude indicates both that the grass-manufacturing industry is of national proportions, and that our present lack of a consistent agricultural policy demands attention.

MANUFACTURERS of chemical products in Great Britain have shown that they are able not only to produce efficiently the numerous chemical materials demanded in every avenue of modern life, but also to display their goods attractively, to stimulate interest and inquiry into their fields of activity, and to organise effective means for the interchange of opinion and the promotion of common interests. Speaking at the fourteenth annual general meeting of the Association of British Chemical Manufacturers, the chairman, Dr. G. C. Clayton, said that as regards chemical exhibitions Great Britain is far ahead of any other country. In none of the big foreign fairs is there a chemical exhibit comparable in magnitude, variety, or interest with that at the British Industries Fair. It is evident, therefore, that the principle that progress must be built on knowledge—a principle lying at the very foundation of the chemical, as of every other, industry—has been applied in the selling branch as well as in the manufacturing branch; the policy is wise and necessary, and should go far in maintaining and advancing the position which British scientific and commercial men have together won for a young, but vital, industry. At the same meeting, Dr. Clayton referred to agreements with the corresponding French and German associations to collaborate in work having in view the greater safety of workpeople. The study of risks of fire and explosion has already been completed, and the results of this inquiry will shortly be submitted to members for their information and criticism. It is satisfactory to find that it has been agreed to regard safety in industry as a matter on which there shall be the fullest and freest exchange of information, subject only to the limitations imposed by the need for safeguarding confidential details of methods of manufacture. Dr. Clayton included in his



address an expression of sympathy with the proposal for the establishment of Chemistry House; the ultimate industrial advantage is, he said, likely to be so great that everyone should do what he can to further the success of the scheme.

At a recent meeting of the trustees of the Beit Memorial Fellowships for Medical Research, Sir James K. Fowler, trustee and honorary secretary, presented the annual report, reviewing the work of the twenty years of the existence of the fund. The Beit Fellowships were founded in 1909 by means of a gift of £230,000 by Sir Otto Beit. The total number of those who have held fellowships to date is 138, a considerable number of whom now hold or have held important posts on the scientific staffs of universities, colleges, and institutes. It is not possible to review the researches which have been carried out by Beit Memorial fellows, but those of Sir Thomas Lewis on the heart and of Prof. Edward Mellanby on rickets have been of outstanding importance. In 1927 a senior fellowship, value £1000 per annum, for research in tropical medicine was created and Dr. Edward Hindle appointed. His work on yellow fever has yielded important results. A vaccine has been prepared from the organs of certain monkeys infected with yellow fever which gives protection to other animals of the same species against a dose of virus a million times as great as that which is fatal to the unprotected. It has also been shown that Europeans may suffer from a mild disease scarcely recognisable as yellow fever, and if this is also true of natives, this may be the means by which the continued existence of the disease is maintained in endemic areas in the intervals between epidemics.

THE following elections have been made to Beit Memorial Fellowships for Medical Research, the proposed subject of the research to be undertaken by Junior Fellows and the place where it is to be carried out being given in brackets: *Senior Fellowship* (value £700 p.a.), Mr. R. J. Lythgoe. *Fourth Year Fellowships* (value £500 p.a.), Mr. P. Eggleton and Dr. F. R. Winton. *Junior Fellowships* (value £400 p.a.), Dr. F. H. Smirk (to study the functional pathology and physiology of diuresis from a biochemical point of view, and to study the functional pathology of plethoras, anæmias, and œdemas—Medical Unit of University College Hospital, London); Dr. G. R. Cameron (to complete work on the histological identification of calcium salts in pathological deposits and to commence study of inflammation in invertebrates—Graham Laboratory, Department of Pathology, University College Hospital School); Mr. J. McMichael (to continue present studies on the interrelationships of liver and splenic disease, mainly by clinical and pathological methods and animal experiments—Department of Medicine, University of Aberdeen); Dr. R. P. Cook (to study bacterial metabolism and its relation to the specific action between host and bacterial parasite—Sir William Dunn Institute of Biochemistry, Cambridge); Mr. N. U. Meldrum (to study the so-called reversible denaturation of hæmaglobin—Sir William Dunn Institute of Biochemistry, University of Cambridge); Mr. D. R. P. Murray (to make a comparison of the two types of proteolytic enzymes charac-

teristic of the tissues and organs and of the digestive tract—Sir William Dunn Institute of Biochemistry, Cambridge); Mr. G. N. Myers (to study the curative action of digitalis, its glucosides, and allies, in general toxæmia and in conditions of shock—Pharmacological Laboratory, Cambridge); Mr. C. A. Ashford (for studies on the (a) metabolism of nervous tissue; and (b) mode of action of vitamin D with special reference to hyper-vitaminosis D—Sir William Dunn Institute of Biochemistry, Cambridge).

THE valuable work which has already been accomplished in Great Britain by the various research associations is well known to workers in pure science and technology. The wide dissemination of the results of their researches and the task of securing adequate appreciation of those results amongst the ranks of industrial workers are, however, matters of considerable difficulty. The British Cotton Industry Research Association attempted in part to meet these points some two years ago by the publication of a report on research in the cotton industry, which gave an account, as free from scientific terms as possible, of the main topics of the published research work of that Association. The British Research Association for the Woollen and Worsted Industries, in its recent publication, "Scientific Aid for the Wool Industries", has supplied a similar summary which should prove valuable to workers in the many branches of the woollen and worsted industries. Reference is made in the report to fundamental researches which are in progress, particularly on the physical, chemical, and biological sides. The textile technologist will appreciate the attempt which has been made to improve existing methods of testing. In this connexion the development of methods for the reeling of yarn, for the testing of yarn levelness, and for the autographic recording of strength and elasticity, deserve special mention. The report offers abundant evidence of the progress of the Association. Its success in its relationship with industry may be judged by the fact that a scheme for the support of the Association by means of a voluntary levy upon imported wool has recently been conditionally adopted by the industry.

WE are glad to learn that, after delay since August 1928, the Cultural Society of Peking and the Government of Nanking have jointly given permission for the renewal of Central Asiatic expeditions of the American Museum of Natural History. Dr. Roy Andrews is now in the field north-east of Kalgan, with a very strong party, including Messrs. Granger, Thomson, and Young of the American Museum staff, Père Teilhard de Chardin as associate palæontologist, two Chinese zoologists and palæontologists trained by Dr. Abel of Vienna, Dr. C. C. Young, and Dr. H. Chang. Lieut. W. G. Wyman, U.S.A., accompanies the party as topographer. The present survey is to the eastward of the Kalgan-Urga Trail where important Pliocene discoveries were made during the 1928 expedition, and the season's work will be chiefly in Pliocene horizons not represented in previous explorations west of the Kalgan-Urga Trail. Dr. Andrews' volume on the



narrative of the Expedition, Vol. I of the quarto series, is nearly ready for the press; Dr. Amadeus Grabau's volume entitled "The Permian of Mongolia" is now in press.

IN a recent issue we published a summary of, and commented upon, Sir Arthur Keith's lectures on recent discoveries of early man and their bearing upon our knowledge of his origin, development, and distribution (see *NATURE*, June 21, p. 935). How these discoveries have stimulated fresh interest in the discussion of man's place of origin may be gathered from an article by Prof. Elliot Smith which appears in the June issue of *Scientia*. As is well known, Charles Darwin in 1871 suggested that the survival in Africa of the two great apes most nearly allied to man pointed to that continent as the dwelling-place of our early progenitors. Many authorities have since taken the same view. On the other hand, the discovery of fossil apes in the Himalayas and of *Pithecanthropus* in Java has been held to point to Asia as the probable home of the human family. The evidence is reviewed, and carefully weighed, by Prof. Elliot Smith in his article. Notwithstanding the occurrence of a fossil ape in southern France, and setting aside the view of Schoetensack in favour of Australia and Ameghino's claim for South America owing to the absence in each of any possible ancestor of man, he concludes that the balance of probability is in favour of Africa. In arriving at this view he attaches considerable weight to the evidence afforded by the Taungs skull, now determined to be of Lower Pliocene age. He holds that while the Taungs skull cannot be mistaken for the gorilla or chimpanzee, and in the absence of prominent eyebrow ridges and in its upright forehead it resembles the orang, it affords definite though slight indications of the beginning of the process of refinement of the features that is an essential part of the transformation of the ape into a human being.

IN October next a pageant entitled "Heart of Empire" will be held at the Royal Albert Hall. The date opportunely coincides with the meeting of the Imperial Conference which is to be held in London during that month. The pageant is to be taken from the book "Hyde Park: its History and Romance" by Mrs. Alec Tweedie, of which a new and abridged edition recently published is noticed in another column. It will last from Oct. 13 to 25 inclusive, and the proceeds will be given to charities. Each evening will have a special character—Oct. 14 the Lord Mayor, Oct. 15 Canada, Oct. 16 Australia, and so forth, the last evening being given to the United Services. It is gratifying to note that what may be called the imperial function of science is not to be overlooked, and one night, that of Oct. 22, is to be devoted to learned societies. Among the list of patrons, which includes the Maharajah of Kapurthala, the Dowager Maharanee of Cooch Behar, the Maharajah of Burdwan, the Duke of Sutherland, the Marquis of Londonderry, the Marquis of Aberdeen, Lord Jellicoe, Lord Meston, Lord Irwin, Viceroy of India, and a distinguished array of ministers, ex-

ministers, and administrators, are also a number of prominent men of science. Among these are Sir John Rose Bradford, president of the Royal College of Physicians; Sir William Bragg, director of the Royal Institution; Sir Charles Close, president of the Royal Geographical Society; Sir Frank Dyson, Astronomer-Royal; Sir Arthur Keith; Sir Ronald Ross; Sir Ernest Rutherford, president of the Royal Society; and Prof. J. F. Thorpe, president of the Chemical Society. The organisers of the conference are to be congratulated on their far-seeing policy, which will bring home to a wide public the vital interest of science in, and its close connexion with, the problems of a world-wide empire such as ours.

MR. J. L. BAIRD has recently made further progress in perfecting the applications of television for theatrical purposes. We see from the *Times* that a demonstration of this new art will form part of the programme of the London Coliseum in the week beginning July 28 and onwards. A disadvantage of the home television sets which are now on the market and receive broadcast television at certain hours of the day is the small size of the televised images. This makes it possible for only two or three people to see the screen properly. In the new apparatus for use in a theatre, the receiving screen is divided into 2100 elements. Each element consists of a cubicle which contains a tiny metal filament lamp, the front of the cubicle being covered with ground glass. The lamps are in circuit with bars on a large commutator. As the commutator revolves, each of the lamps is switched on in succession. The whole of the 2100 lamps are switched on and off in one-twelfth of a second. When operating, the incoming television signal is first of all amplified. The amplified current then flows through the revolving commutator. The current is strong at a bright part of the picture and weak at a dark part, and the picture is built up of a mosaic of bright and dark lamps. The lamps are not instantaneous in their action, and in this respect they differ from those used in other television devices. Great brilliancy, however, is attained by this means, and the flickering is much reduced. Experiments have been made at the Baird laboratories on the transmission of images showing considerable detail. It seems quite feasible to broadcast these pictures to distant cinemas by means of land lines.

A CIVIC Week lecture on "Science and the Fishing Industry", delivered at the University College, Hull, on Oct. 16, 1929, by Prof. A. C. Hardy, has been recently published as a pamphlet by Messrs. A. Brown and Sons, Ltd., Hull, price 6d. Prof. Hardy, who was chief zoologist to the *Discovery* expedition, discusses at some length the bearing of marine biological research upon the problems which confront the fishing industry. The men of science, he points out, by patiently investigating the many factors, some known, many yet unknown, which influence marine life, are gradually piecing together the story of what is going on below the surface of the sea. The work is laborious, disappointments are many, and progress is slow. Nevertheless, much has already been done, and last year,



for the first time in history, it became possible to forecast the prospects of certain fisheries. This is a great achievement, and Prof. Hardy is confident that, with more knowledge, this work can be extended and perfected so as to be of immense practical value. To bring immediate financial benefit to the trade, however, is not the only function of marine investigation. Much of its efforts must of necessity be directed towards the accumulation of knowledge which will result in no immediate gain to the industry, but is absolutely necessary as a basis for intelligent legislation in future, should occasion demand it. A strong plea is made for more co-operation between science and the industry—between the research worker and the fisherman. Each has much to learn from the other. Stress is also laid upon the paucity of financial support for scientific research. The trade, says Prof. Hardy, pays but a few hundred pounds a year to research institutions, and that more as a kind of charity than as an economic investment. To be of real benefit, research must be carried out on a scale bearing a reasonable relation to the magnitude of the industry. For this to be done, ample funds are essential.

At the recent World Power Conference, Dr. Oskar Oliven gave a remarkable address on a "European Grid Power System". He pointed out the gradual growth of small power plants to huge power stations, the voltages of which were ever increasing. Inter-connexions were being made between these stations, resulting in important economies being effected. Exchange of energy and compensation of load were now taking place over political frontiers, and the question had now become one which had to be considered by the whole of Europe. The problem could be solved if the visible and invisible boundaries which separated nations could be freely opened to the passage of electric energy for their mutual benefit. The idea of the peaceful co-operation of nations was gaining ground. The approximate length of the European super power system he suggested was 6000 miles. It included Calais, Rome, Constantinople, and Oslo. Britain and the northern part of Russia are left out for economical reasons. He assumes that capital can be obtained at  $4\frac{1}{2}$  per cent interest, and that the total cost would be about £100,000,000. He calculated that the average cost per unit would be reduced to about the fifth of a penny. He proposes to use a supply pressure of 400 kilovolts. There are now no technical difficulties in the way. He considers that the utilisation and application of electricity has become one of the strongest factors in international economy. A map of the proposed European grid is published in the *Electrician* for July 4.

At the ninth annual general meeting of the Empire Cotton Growing Corporation, held in Manchester, with Lord Derby in the chair, on May 29, his son, Lord Stanley, made some very interesting comments upon the possibilities of agricultural development in India as affected by the coming completion of the Sukkar Barrage on the River Indus. With the completion of this barrage, which is anticipated for 1932, it is

estimated that the irrigated area in India will increase from 2,035,000 acres to 5,394,000 acres, and much of the new land is thought to be of very good quality, capable of producing a better class of cotton than is at present grown in any cotton district. Lord Stanley made two very important and suggestive criticisms in connexion with this vast scheme. He pointed out that if full use is to be made of this new area under irrigation, the advisory research services which must guide in technical matters should be created *now*; Lord Stanley is emphatic that progress should be speeded up in this direction. He also pointed out that it is essential that some large estates be created in the new irrigation area, with the necessary capital and equipment in men and materials to enable new methods of cultivation, adapted to the changed conditions, to receive a thorough trial. The small cultivator is too conservative and too poorly equipped to make the necessary trials of new methods, and unless some large estates are organised in good time, much time may be lost after irrigation commences in learning how to make full use of the new potential sources of agricultural fertility.

THE first report of the Museum of Science and Industry, Chicago, founded by Mr. Julius Rosenwald in 1926, covers the period July 1928 to December 1929, and is a record of very active progress which, if maintained, will place the Museum in the forefront of such institutions in the United States. The provision of a building is always a serious matter, but it appears that from the first the founder had in view the utilisation of the much-admired Fine Arts Building erected for the World's Fair in Jackson Park in 1893. It is more than doubtful whether it would not have been wiser to have had a new building. Facts go to show that the cost of reconditioning this old building is going to be as great as the cost of a new one without any corresponding advantages. The Director, Mr. Waldemar Kaempffert, was appointed in 1928, and he has studied the older institutions of the same kind in Europe, particularly the Deutsches Museum at Munich. It is evident that he has been strongly influenced by what he has seen and no radical departure from them appears to be in view. He is alive to the necessity of drawing up beforehand schemes of what ought to be shown, and he is avoiding the pitfalls of accepting objects not strictly within the scheme; he is obtaining, too, the co-operation of individuals and firms. In fact, the idea of the industrial museum at last seems to have gripped the American imagination. We wish the institution much and early success.

In the annual report of the Geophysical Laboratory of the Carnegie Institution of Washington for 1928-29 (*Year Book* No. 28 of the Institution), the director (Dr. A. L. Day) describes two important scientific expeditions in which the laboratory has participated. The first was for the study of volcanoes in the Dutch East Indies, where many active volcanoes are found within a small area; Dr. Zies, who undertook this work, went provided with spectrographic apparatus for the investigation of volcanic flames. This part



of the programme was unsuccessful, but valuable experience was obtained which it is hoped to utilise later; and gases, incrustations, and lavas were collected which have provided interesting material for laboratory studies. The other expedition was a gravity-measuring cruise in a United States submarine, using the methods and apparatus of Dr. Vening Meinesz, who accompanied the expedition; the U.S. Navy and the National Academy of Science co-operated with the Geophysical Laboratory in this work. A cruise of 45 days was undertaken in October and November 1928, in the Gulf of Mexico and the Caribbean Sea. Measurements of gravity were made at 46 sea stations, as well as others in various harbours. It was found that isostatic compensation in the Mississippi Delta is practically complete, despite the deposition of nearly 12 billion tons of matter there each year. But anomalies indicate that the Nares Deep is a recent uncompensated geological feature in which there must be large shearing stresses (see NATURE, Mar. 23, 1929, p. 473).

THE University of Melbourne has recently issued in bound form several volumes of "Collected Papers from the Science Laboratories". Vol. 5 consists of separate that have appeared during the years 1910-1928 and come from the following departments: Anatomy, 9 papers; zoology, 19 papers; and veterinary science, 14 papers. The papers cover a wide range of subjects, and in all departments deal with matters not only of local interest or rather concerning local material, but also of a more general nature. The former group contains anatomical investigations of Tasmanian aborigines and Melbourne criminals; a number of descriptions of new Australian invertebrates, parasitic and otherwise, and studies on the parasites and diseases of Australian cattle. The second group include anatomical studies of man and other mammals; investigations into the development of the fowl, and parasites and diseases of cattle not limited to Australia. Altogether the papers show a commendable recognition of the importance of research as an essential function of University activity. From the personal point of view we are glad to see the name of Baldwin Spencer as part author of one of the papers in the zoological section, as it is probably the last paper by one whose recent death has deprived the University of an outstanding personality.

THE Report of the Secretary of the Smithsonian Institution for 1929 records a year "gratifyingly and unexpectedly rich in progress". One of the most important ventures has been the addition to the research laboratories of a new department, the Division of Radiation and Organism, the object of which will be to investigate the relationship between radiation and the growth and health of plants and animals. During the year twenty-nine expeditions, fitted for anthropological, geological, biological, or astrophysical investigation, sought knowledge and materials in distant parts, from Alaska to China, Cuba, and Haiti. As material has flowed in publications have flowed out, including, in addition to the usual monographs and articles, four volumes of the

12-volume set entitled "Smithsonian Scientific Series". The National Zoological Park has obtained a new building for birds, believed to be the best for its purpose in the world, and provision has been made by Congress for a new reptile house equally well designed; and certainly not least, an extensive collection of paintings and art treasures, valued at several million dollars, has been given by Mr. John Gellatly to the Smithsonian for eventual exhibition in the National Gallery.

WITH reference to our remark (June 14, p. 901) on the lack of a serious policy for the encouragement of children in the national museums, Dr. G. H. Carpenter sends us an account of the school work conducted in the Manchester Museum. Five trained teachers specially appointed by the City Education Authority take five classes a day, and each class, paying a weekly visit, gets a systematic course of lessons, with the advantage of illustrative specimens and objects freely placed at the teachers' disposal. Such an arrangement is excellent; it is the best possible plan under the passive system where the museum allows the fullest use to be made of its treasures. Our notion was that, if the system of the Peabody Museum were adopted, the national museums by means of their own staffs—specially appointed for the purpose, of course, but responsible to the museum authority—would become active agents in spreading knowledge of their treasures inside and outside the museum. We look forward to a time when it will be recognised that education is as much the duty of a museum as is the care of specimens.

ETON COLLEGE has followed excellent precedents in having formed a Natural History Society, the threefold purpose of which is to observe and collect local plants and animals, to make and listen to lectures, and to keep a log-book of all observations. The first annual report (1930) records a creditable number of these original faunistic observations, which concentrate upon the stock lists of birds and Lepidoptera; but there are many little problems of local distribution and numbers, of life-habits, and seasonal changes, which the members could tackle with advantage to their own powers of observation and reasoning, and to the advance of scientific knowledge. There is evidence in the report of abundance of enthusiasm, and we wish the new Society a long life and a busy one.

IN the General Report of the Survey of India 1928-1929 one of the most notable achievements recorded is the completion of the survey of Chitral on the 1-inch and  $\frac{1}{2}$ -inch scales. This was one of the most difficult pieces of work in the survey of India. Another achievement was the survey of about 800 miles of previously unexplored country in Bhutan by permission of the Bhutanese Durbar. A summary of topographical surveys shows that about forty-eight thousand square miles was surveyed during the year, an area rather in excess of the average of recent years. So steady is the progress of the work that rather more than half the total area of the Indian Empire has now been surveyed, mainly on a 1-inch scale, but in places



on a  $\frac{1}{2}$ -inch or  $\frac{1}{4}$ -inch scale. The report contains a key sheet to all maps of the survey of India.

THE North-West Territories Branch of Canada's Department of the Interior has issued a finely illustrated handbook entitled "The North-West Territories, 1930". This gives besides a general account of an area which embraces over a third of Canada, many valuable notes on the forests, other vegetation, and wild life. Particular attention is paid to the Eskimo, who, according to a census made in 1927, number little more than 7100. The Department of the Interior has also published a revised map of the North-West Territories on a scale of 60 miles to an inch. It has no orographical detail but there are a wealth of names and indications of all the police and trading posts and the position of the game preserves. From the Natural Resources Intelligence Service of the same department comes a finely illustrated volume on the province of New Brunswick with several maps and much statistical information. Copies can be obtained free of charge from the National Development Bureau, Ottawa.

ALTHOUGH the present buildings of the Mellon Institute of Industrial Research were completed only in 1915, for practically ten years the Institute has had a waiting list of companies with problems for investigation. A new building is therefore to be erected and work on it will start this year. In addition to providing a greatly increased number of laboratories, the new building will give more commodious quarters for the general departments. The present library contains 11,000 volumes; the new library is planned to accommodate 250,000 volumes. The present Department of Research in Pure Chemistry will be expanded and facilities for pure research in other branches of science will be provided. Much more elaborate chemical engineering laboratories are to be available, and the fellowships in each specific field of industrial research are to be grouped in suites of rooms so that they can best make use of general apparatus adapted to their needs. Certain rooms will be equipped for specialised phases of experimental technique, such as electrochemistry, spectroscopy, low-temperature studies, radiations, high-pressure experimentation, etc. Other special features to be included are a large lecture hall, a dining hall, an industrial fellowship museum, and an underground garage. The new laboratory will be seven stories high, with monolithic columns along all four sides, and approximately 300 feet by 400 feet. The laboratories are to face on interior courts, and additional laboratory suites can be constructed in the interior courts without interfering with the original laboratory units.

THE Messel medal of the Society of Chemical Industry was presented to Lord Brotherton of Wakefield during the forty-ninth annual meeting of the Society, for his services to chemical industry.

THE Minister of Agriculture and Fisheries, with the approval of the Army Council, has appointed Brigadier H. St. J. L. Winterbotham to be Director-General of the Ordnance Survey, in succession to Brigadier E. M.

Jack, who retires on July 31 next. Brigadier Jack was president of Section E (Geography) of the British Association for the South Africa meeting last year.

A PROGRAMME has now been issued of the Southampton meeting of the Institute of Metals, to be held on Sept. 9-12. The proceedings will be opened on Sept. 9, when the ninth autumn lecture will be given by Prof. D. Hanson, on "The Use of Non-Ferrous Metals in the Aeronautical Industry". The mornings of Sept. 10 and 11 will be devoted to the reading and discussion of metallurgical papers, several of which are being contributed by distinguished metallurgists from abroad. Some attractive visits and excursions, including a trip to Cherbourg during the following week-end, have been arranged in connexion with the meeting.

A CONFERENCE on Soil Science Problems, to be opened by the Right Hon. W. G. A. Ormsby-Gore, will be held at the Rothamsted Experimental Station on Sept. 16-18 under the auspices of the Imperial Bureau of Soil Science. The discussions will cover soil analysis, surveys, field experimentation, and similar topics. The Conference will be the occasion of the annual visit of Empire agricultural officers.

A FURTHER step to encourage co-operative marketing in Great Britain is seen in the modification of the terms under which loans to marketing enterprises are issued. The Ministry of Agriculture's Advisory Committee on Co-operation and Credit has recommended that the initial period of remission of interest on a loan may be extended from two up to five years. Full particulars are published in Marketing Leaflet No. 19, which may be obtained post free from the Secretary, Ministry of Agriculture and Fisheries, 10 Whitehall Place, London, S.W.1.

A CORRESPONDENT has directed our attention to the fact that recently two tubes of anhydrous aluminium chloride supplied to a school laboratory exploded on opening. It should be kept in mind that these tubes frequently contain a considerable pressure of hydrogen chloride gas and are liable to burst if any attempt is made to open them with a file. The tubes are perhaps best opened by wrapping in a thick duster and softening the drawn out end with a blowpipe flame. When the rush of gas ceases, the tube may be cut open. We think it would be advisable for the dealers to attach some such information as a label on the tube, but in any case those teachers who are not aware of the danger would do well to take note of it and should never allow pupils to open such tubes.

AN International Illumination Congress will be held in Great Britain in 1931 under the auspices of the International Commission on Illumination (which succeeded the International Photometric Commission) and is being organised by the National Illumination Committee of Great Britain and the Illuminating Engineering Society. The first week of the Congress, Sept. 3-12, will consist of a tour starting from London and visiting Glasgow, Edinburgh, Sheffield, and Birmingham; technical sessions will be held at each city. The second part of the Congress, Sept. 13-19,



will be at Cambridge. The subjects for discussion include factory lighting, street lighting, museum lighting, laboratory technique, and so on. The countries represented by National Committees on the International Commission on Illumination include most of the European powers, Japan and the United States; the president (1927-31) is Mr. C. C. Paterson, honorary secretary Dr. J. W. T. Walsh, and central bureau the National Physical Laboratory, Teddington. The honorary general secretary of the 1931 Congress is Col. C. H. S. Evans, c/o Illuminating Engineering Society, 32 Victoria Street, London, S.W.1.

APPLICATIONS are invited for the following appointments, on or before the dates mentioned:—Assistant entomologists under the Division of Economic Entomology of the Australian Commonwealth Council for Scientific and Industrial Research, for research work on buffalo fly and blowfly problems—F. L. McDougall, Australia House, Strand, W.C.2 (July 30). A lecturer and demonstrator in plant pathology at the Swanley Horticultural College—The Principal, Horticultural College, Swanley, Kent (July 30). An evening teacher in electrical engineering at Goldsmiths' College—The Warden, Goldsmiths' College, New Cross, S.E.14 (Aug. 2). A lecturer in

charge of the mining department of the Walker Technical College, Hartshill, Wellington, Shropshire—The Principal, Walker Technical College, Hartshill, Wellington, Shropshire (Aug. 9). A curator of the natural history department of the Kelvingrove Art Galleries and Museums, Glasgow—The Town Clerk, City Chambers, Glasgow (Aug. 15). A cotton classer, a cotton entomologist, and an assistant pathologist, each under the Department of Agriculture and Stock, Brisbane—The Official Secretary, Queensland Government Offices, 409 Strand, W.C.2 (Aug. 20). A lecturer in chemistry at the Leicester College of Technology—The Registrar, Colleges of Art and Technology, Leicester (Aug. 25). A demonstrator in chemistry in the University of Aberdeen—The Secretary, The University, Aberdeen (Aug. 30). An expert hydrobiologist for fisheries investigations in Turkey—The Expert-Adviser of Fisheries—Mr. E. C. Weberman—Beyoglu, Sira Servi 4, Istanbul, Turkey (Sept. 15). A George Herdman professor of geology in the University of Liverpool—The Registrar, The University, Liverpool (Sept. 30).

ERRATUM.—In NATURE for July 19, p. 109: Paragraph "The Planet Saturn", line 7, for 838,500 read 838,500,000.

### Our Astronomical Column.

**Recent Solar Activity.**—During the last few months there has been a noticeable absence of large sunspots and a steady diminution each month since January in the average daily number of groups. Although the solar cycle is progressing towards minimum, the very active period (Nov. 1929-Jan. 1930) and the present one of decline (Mar.-June 1930) would seem to be merely one of the many 'ups and downs' shown by the sunspot curves of preceding cycles when plotted from means taken over periods of a month or of a solar synodic rotation. Unless the present cycle is abnormal, the minimum is to be anticipated about 1934. During the last fortnight there have been signs of a revival of activity. On July 13-14 two large prominences were seen at the sun's east limb, and they could be followed as dark absorption markings in hydrogen or calcium light as the sun's rotation brought them across the disc. The larger and more massive prominence, in latitude about 25° N., was seen with the spectrohelioscope at Greenwich on July 18 as a strongly defined marking nearly 6' in length, although still somewhat foreshortened, and inclined about 30° to the sun's equator.

**The Approaching Opposition of Eros.**—Eros will be nearest to the earth at the end of January 1931, when its parallax will be 50.3". Dr. H. Spencer Jones contributes a paper with useful hints to observers which is published in *Astr. Nach.* 5715.

The rapid motion of Eros makes short exposure times and rapid plates desirable. The relative advantages of guiding on Eros or on the stars are discussed. It is thought that a suitable plan may be to follow Eros in R.A., but allow it to trail in declination. It will be brighter than most of the comparison stars, and its light should be reduced by a rotating sector. No photographs should be used in which the conditions of seeing have not been constant, as this may involve an error in the effective mean time of mid-exposure.

The light of Eros is sometimes subject to rapid

variations; this also may affect the mean time of mid-exposure. The times of beginning and end of exposure must be accurately noted, on account of the rapid motion.

One of the useful by-products of the campaign will be an improved mass of the moon. Photographs for this purpose should be taken at the times when the difference of the R.A. of Eros and the moon is near 0<sup>h</sup>, 6<sup>h</sup>, 12<sup>h</sup>, 18<sup>h</sup>. These photographs may be taken near the meridian, whereas those for parallax in R.A. are taken at large hour-angles.

It is recommended that stars of extreme colour (types *B* and *K5* to *M*) should not be used as comparison stars. *Harvard Bulletin* No. 871 gives the spectral types of the primary reference stars that are not in the Henry Draper Catalogue.

**Meteors connected with Comet 1930 *d*** (Schwassmann-Wachmann).—It was noticed soon after the discovery of this comet that its orbit approached that of the earth fairly closely. A watch for possible meteors was kept at the Kwasan Observatory, Kyoto, Japan. *Bulletin* No. 172 of the Observatory reports that Mr. T. Miyasawa observed numerous meteors on May 21 and the following nights. Mr. S. Sibata has derived the following orbit for the meteors; the latest orbit for the comet, by Miss Hayford and Mr. Anderson, is given for comparison:

Meteors.	Comet 1930 <i>d</i> .
T	1930 June 14.21981 U.T.
$\omega$ 212° 24'	192° 19'.4
$\Omega$ 60 10	76 45.2
$i$ 18 50	17 17.9
log $q$ 9.965	0.004934
Period —	5.2668 years.

Mr. H. E. Wood has pointed out that there is a general resemblance between the orbit of this comet and that of comet Pons-Winnecke, suggesting that the two comets may have had a common origin.