

Office for Education should be set up for all time, and be oriented toward the future, toward a socially improving future. Particular educational systems in any country are not suggested. Rather, the International Office should act as a clearing-house for educational ideas, an information centre for the educators and for the educational bureaux and ministries that need guidance and specific assistance in the improving of their work. In the specialized sciences and arts there have long been useful international unions. In their limited fields such organizations have shown how relatively simple it is for the people of all nations to co-operate. What has been done in the sciences can certainly be done in the general educational field. The great usefulness of the International Labour Office during the past two decades shows how important, for international understanding, an organization of this sort can be. That the establishment of an International Office of Education appeals to Americans of all sorts has been indicated by the rapid support received from scores of important organizations—from church, labour, industry and education—and from numerous members of the National Congress. It is hoped that the American Government will join with the other free governments of the world, in an official recognition of the essential part of education in the planning for a better and more peaceful world.

### Visual Aids in the Schoolroom

THE remarkably comprehensive and suggestive paper recently read at the Royal Society of Arts by Mr. R. W. Moore, headmaster of Harrow, calls for special comment. The progressive teacher, he said, is alive to the uses of the epidiascope, and films have established themselves as an important subsidiary in schools. In the past, visual factors have been neglected, no doubt. Yet, he said, we must ask ourselves whether worse dangers than those of neglect are not involved in the uncritical multiplication of visual aids now prevalent in some quarters. Illustration is confused with explanation. Excess of detail, leading to distraction and irrelevance, abounds. True, the development of new processes promises a great enrichment for teacher and pupil; but our chief need is that of a psychology of education which will take account of these visual adjuncts and order them. The subjects which most need visual aids, said Mr. Moore, are science, history and geography. Of the three, he proceeded, science is the best case, because observation has long since been recognized as basic in the scientific tradition, and also scientific men have a professional bias towards, and a mechanical dexterity in, the manipulation of visual aids. History is the most difficult to accommodate to such aids. Geography stands between. It is the study of man in his natural environment. As a subject, it has only recently emancipated itself from the verbalism of the academic tradition. It should have its roots in observation and begin with local investigation. But how are we to extend the process towards a knowledge of world geography? How is the child in a poor London school to observe India and South America? Films are here intensely valuable, but the material available is sadly thin. The present needs are: (1) that research and experiment be made inside the teaching profession towards ascertaining what visual aids are appropriate to particular subjects and purposes, and (2) that there should be thorough co-operation between teachers and manufacturers before and during production.

### A Natural Elastic Polyester

SOME of the newest and most fascinating developments in applied science lie in the field of high polymers—and yet the story of high polymers, since they form the principal physico-chemical basis of life, is one of the oldest and most fundamental in the world. Most natural chain-molecules still cannot be synthesized by man; but he can build many others that are not found in Nature. Among the latter were thought to be the polyesters, first synthesized by Carothers and Arvin in 1929. It is reported now by A. R. Kemp and H. Peters (*India Rubber World*, 110, 639; 1944) that what seems to be very likely a polyester constitutes the highly elastic skin that fits tightly round the seeds of *Smilax rotundifolia* Linn. The ripe berries usually contain three seeds about  $\frac{1}{2}$  cm. in diameter, each enclosed in a membrane about 0.003 cm. thick. On removal, the membrane is found to be stretchable by 300–400 per cent and to give then a typical X-ray fibre photograph with a probable fibre period of about  $22\frac{1}{2}$  Å. This finding, taken in conjunction with chemical analyses carried out on the skins both before and after hydrolysis with alcoholic caustic potash, indicates that the main component is a polyester formed by the repeated condensation of a unit having 17 or 18 carbon atoms in the chain with two hydroxyl side groups, the suggested empirical formula of the monomer being  $C_{18}H_{36}O_5$ . The conclusions are for the present tentative, but they are by no means unconvincing, and the results of further investigation—very much worth while—will be awaited with interest.

### Earthquake in Japan

ONE of the most violent earthquakes of recent years was recorded by the seismographs at Kew, West Bromwich, New York and Bombay, and probably throughout the world, on December 7. At West Bromwich it was recorded at 4h. 48m. 38s. G.M.T., and the waves were so violent that the recording mechanism was upset. At Fordham, New York, the Rev. J. J. Lynch believes from a preliminary investigation of his records that two shocks were recorded, at 12.49 and 12.53 a.m. (local time). The Japanese News Agency stated that the Island of Honshu was affected, and that it was believed that the epicentre was in the Sea of Nshu. The Tokaido district was affected and also Shizuoka, Hamamatsu, Nagano and Nagoya, the third largest city of Japan. There was some damage to property and a seismic sea-wave affected Shizuoka. It appears unlikely that further details will be obtainable from Japan until the end of the War; but this was undoubtedly a very great earthquake, and when the records are examined closely the epicentre will be found more precisely.

### The Phosphorus Cycle in Nature

FOR his presidential address to the Geological Section of the Congress of the South Eastern Union of Scientific Societies, held on October 14, Dr. K. P. Oakley took as his subject "Man and the Migrations of Phosphorus". For some time after the earth's formation, the phosphorus cycle in the sea was simple, the phosphate ions being built up into the earliest forms of organic life and released again at their death, the only loss occurring through the precipitation of phosphate ions accumulated at the lower levels, with the formation of sedimentary rock phosphate beds. Following the emergence of life from the sea and the

colonization of dry land, a soil-plant-animal-soil cycle arose, from which phosphorus was removed in small quantities in the formation of bone beds, fossil fish or guano deposits. With the development of agriculture in historic times, however, the phosphorus cycle has been seriously upset, for systematic cropping reduces the reserves in the soil more quickly than they can be renewed from fresh sources. In the past few centuries man has attempted to restore the phosphorus balance by the use of fertilizers, derived largely from natural deposits; but he has also accelerated the transference of phosphorus from plant and animal life to the sea, thus speeding up its cyclical migration in a two-fold manner. Although this has been of undoubted benefit to man, it will ultimately lead to a state of bankruptcy with regard to the element. The world reserves of workable mineral phosphate are within measurable distance of exhaustion, and although new sources may be discovered, a planned economy in their utilization seems called for, as no substitute for phosphate exists and it is essential to the survival of a large human population. The address, which includes a historical account of phosphatic fertilizers, is to be published in the January issue of the *South Eastern Naturalist and Antiquary*.

#### Mathematics in China

In addition to work directly for the war effort and in spite of difficulties of communication, mathematicians in China are able to produce a considerable amount of new work of the highest quality. In particular, we may mention Prof. L. K. Hua, of the Tsing Hua University in Kunming, whose visit to Cambridge during 1936-38 will be remembered. The following information has been received through the British Council Cultural Scientific Office at Chungking. Prof. Hua has just completed a booklet on additive prime number theory which will be published by the Academy of Sciences of the U.S.S.R. The first of a series of papers on the theory of automorphic functions of a matrix variable has just been published in the *American Journal of Mathematics*. Related to this is a theory of modular functions connected with linear associative algebras, which is so far unpublished. Another field in which Prof. Hua has been working is that of the geometry of matrices, related to topological algebra. In addition, Prof. Hua has continued his studies in the geometry of numbers and, in extending theories due to Minkowski and Dr. K. Mahler, has discovered a new type of convex body.

#### Astronomical Observations in Spain

In the issue for 1944 of the *Boletín Astronómico Del Observatorio De Madrid*, E. Gullón supplies a résumé of the observations of solar prominences during September-December 1939. Owing to the removal of certain equipment from Valencia to Madrid and to other causes, observations could not commence before September 1. Sunspot observations during the same period were made by E. Gullón and Martín Lorón with the 20-cm. Grubb equatorial, and the results are shown on pages 14-16. Solar prominences during 1940 were observed by E. Gullón and the results are given in the same form as those observed during 1939. The last section of the bulletin deals with sunspot observations carried out by E. Gullón and Martín Lorón at Madrid and Valencia in 1940. Those at Madrid were made by means of a Herschel helioscope mounted on the 20-cm.

Grubb equatorial, focal length 3 m., and those at Valencia were made with another equipment of a similar type on the 15-cm. Grubb, and with a focal length 2.20 m.

#### Swedish-made Drugs

ACCORDING to the August issue of the *Anglo-Swedish Review*, a new local anæsthetic has been discovered which in several respects far surpasses novocaine, which Sweden had hitherto to import. This new anæsthetic has been named LL 30, the letters standing for the names of two young scientific workers Lövgren and Lundquist, and the figure representing the number of anæsthetic compounds tried and discarded during their six years of investigation. LL 30 is now being made on a commercial scale by the Astra concern of Södertälje not far from Stockholm, where penicillin is also being manufactured. Sulphonamide preparations are being manufactured from Swedish raw materials, and its price is now down to half that of the imported foreign preparations.

#### Books on Historical Medicine and Science

THE annotated catalogue issued by Schuman's, 30 East 70th Street, New York, under the name of "Medical Miscellany List 'J'", includes, besides a large number of miscellaneous works on medicine and science, two sections devoted respectively to neurology and psychiatry and war medicine. The miscellaneous works include books by Baillou on epidemiology, diseases of the skin by Alibert, anthropology by Blumenbach, physiological optics by Helmholtz, as well as the first fifteen volumes of the *Memoirs of the Royal Academy of Surgery of Paris*. Among the books on neurology and psychiatry are works by Brown-Séquard, Freud, Janet, Kraft-Ebing, Puschmann, Spallazani and Vesalius. The section on war medicine contains Hans von Gersdorff's field book of surgery (1528), John Pringle's "Observations on the Diseases of the Army" (1765) van Swieten's "Diseases incident to Armies" (1776) and works on the American Civil War (1861-1870), including documents concerning the United States Sanitary Commission.

#### Announcements

AFTER nearly two years in China, Dr. Joseph Needham, director of the British Council Cultural Scientific Office in China, has returned to Great Britain for consultations. He will be returning to China early in the New Year.

PROF. J. M. MACKINTOSH, professor of public health in the University of London, has been appointed dean of the London School of Hygiene and Tropical Medicine as from January 1, 1945.

At the annual general meeting of the Scientific Instrument Manufacturers Association of Great Britain, Ltd., the following officers were elected: *President*, Mr. F. Wakeham; *Vice-Presidents*, Mr. J. Hasselkus and Mr. J. T. Offer; *Hon. Treasurer*, Mr. J. E. C. Bailey; *Hon. Secretary*, Mr. G. A. Whipple.

THE Association of Scientific Workers is organizing a conference to discuss the use of science in the post-war world, to be held at the Caxton Hall, London, S.W.1, during February 17-18, 1945. Further particulars will be obtainable in due course from the Association of Scientific Workers, Hanover House, 73 High Holborn, London, W.C.1.