

four hundred brass stencils, apparently used by Franklin in the study and designing of type, as well as inventories of fonts cast at Passy and of type and other printing materials purchased from the leading English, French and possibly Dutch type-founders. Other articles in this number include Prof. G. Chinard's study of Franklin as negotiator, December 1777, Prof. P. A. W. Wallace's appreciation of H. E. Muhlenberg's work as botanist, Prof. T. D. Cope's note "Collecting Some Material about Charles Mason and Jeremiah Dixon", the astronomers and geodetic surveyors, and Prof. I. J. Cox's account of the Freeman Red River Expedition of 1806.

Establishment of Hardwoods in Britain

MANY will welcome the small Forestry Commission pamphlet No. 2 of the Forest Operations Series (who invents these cumbersome titles?) on the "Establishment of Hardwoods" (London: H.M. Stationery Office. 9d. net). The small area of 35,000 acres only was afforested or replanted in Britain with various hardwoods during the first twenty-five years of the Forestry Commission. A bulletin recording the information so far gathered on the subject of sowing and planting to form the new plantations was in the press just before the outbreak of war, but was destroyed during the bombing of London. The present one has been prepared from a report of Mr. A. H. Popert, acting conservator in the south-west of England, as a result of a tour of the Commission's hardwood plantations. It is perfectly well known that the raising and tending of young hardwood crops, save in exceptionally favourable circumstances of habitat, are more difficult and call for more experience than is required for conifers. The bulletin gives notes on the chief timber species—oak, beech, ash, sycamore, sweet chestnut, birch and alder. It also deals with the treatment of coppice woods and devastated woodlands; on these latter subjects, some who have lived with and studied coppice areas may differ from the views contained in the paper. As a result of war-time and present-day fellings of the fine hardwoods, it is noted that the "Establishment of broad-leaved trees is likely to assume increasing importance in British Forestry".

"Not poppy, nor mandragora . . ."

"An Index of Modern Remedies", by William Mair, has, since it was first published in 1941, been useful to the medical and pharmaceutical professions, to whom alone it is issued. The appearance of a new edition (Fourth Series, 1948. *Scottish Chemist*, 240 Albert Drive, Pollokshields, Glasgow, S.1; and from Messrs. H. K. Lewis and Co., Ltd., 136 Gower Street, London. 3s.) will therefore be welcomed. This new edition contains, as well as a few recently coined names of remedies, a valuable article on the 1948 edition of the British Pharmacopœia, with lists of the 250 new admissions to this publication and of the omissions from it. There is also a useful list of costly and essential drugs now exempted from the purchase tax. As Mr. Mair rightly says in his introductory note, no physician or pharmacist can nowadays be familiar with the names, composition and action of all the pharmaceutical preparations on the market, and he has set out to give this information in a handy and well-indexed form. He also gives, by means of a key, the names and addresses of manufacturing chemists and the preparations which they make. Using this book, one realizes how many names some drugs nowadays have, the changes these names

have undergone and how different they may be in different countries. Pentothal, for example, is now thiopentone soluble B.P. and U.S.P., and aminacrine hydrochloride B.P. used to be, and no doubt still is in some quarters, acramine, monacrin or acramine yellow. The maze of names given to the antimalarial drugs and to the sulphonamides and their derivatives are here sorted out, and a short supplement lists special injection solutions for parenteral therapy. More than half the book is devoted to a classification of various remedies according to their mode of action. In this section the statement that phenothiazine is an anthelmintic of low toxicity needs modification. As Prof. J. H. Gaddum says in his foreword, this book is a valuable guide and provides information not easily obtained elsewhere, even in more expensive books.

Pfund Issue of the *Journal of the Optical Society of America*

THE October 1947 issue of the *Journal of the Optical Society of America* is the largest issue of the journal ever to be published and was specially called the "Pfund Issue". It consists of articles written by Prof. A. H. Pfund's former students and colleagues and is a tribute to him on his retirement from active teaching at the Johns Hopkins University. An advance copy of this issue, together with a 'scrap-book' containing the letters which accompanied the manuscripts of the articles when they were submitted for publication, was presented to Prof. Pfund at the dinner held during the thirty-second annual meeting of the Society in October last. A photograph of Prof. Pfund is on the opening page, and the first of the twenty-three articles in the issue is by Prof. R. W. Wood, who writes on "The Use of Echelette Gratings in High Orders". Two of the articles are actually by Prof. Pfund himself and co-workers, but he was unaware that his colleagues had submitted the papers for a special issue of the *Journal*. They deal with selective infra-red gas analysers and with optical scattering by dielectric powders. The other articles include: a historical note on the rate of a moving clock by H. E. Ives; a spark light-source of short duration by J. W. Beams and others; an optical study of acoustic fields near diffraction edges by J. C. Hubbard and others; and practical methods of making and using multilayer filters by Mary Banning.

Hot-wire Vacuum Switches

SUNVIC CONTROLS, LTD., 10 Essex Street, Strand, London, W.C.2, manufacturers of vacuum switches, temperature control and associated equipment, have recently issued a 16-page illustrated pamphlet describing their hot-wire vacuum switches. The Sunvic hot-wire vacuum switch is contained within an evacuated glass tube not much larger than an ordinary radio valve, and is a non-arcing electric relay, the operation of which depends on the fact that when an electric current is interrupted by the separation of two surfaces in a vacuum no arc is formed. The movement necessary to close or open the switch is quite small and is provided by the thermal expansion of a special steel wire through which a control current of some 25–60 m.amp. is passed. The switch contacts are tungsten and are normally held apart against a compressed spring, which is released by the expansion of the hot wire. The operating characteristics of many different forms of hot-wire vacuum switches with various time delays,

closing currents and current-carrying capacities are listed, and twelve different standard circuit and wiring diagrams are shown. The hot-wire vacuum switch is capable, in various sizes, of handling up to 10 kW. at 440 volts, and is suitable for controlling alternating or direct currents up to 30 amp. and voltages from 10 to 600.

J. J. Thomson on "Cathode Rays"

THE text of J. J. Thomson's historic Royal Institution lecture of April 30, 1897, on "Cathode Rays", has been reproduced in full in the November-December issue of the *American Journal of Physics* as the contribution of the American Association of Physics Teachers to the Electron Jubilee celebrations (see also *Nature*, 160, 776; 1947). It will be recalled that it was in this lecture that J. J. Thomson, after discussing Lenard's, Perrin's and some of his own experiments on the charges carried by cathode rays, concluded that "the size of the carriers [of electrical charge] must be small compared with the dimensions of ordinary atoms and molecules". Further, that from his experiments on the deflexion of cathode rays, he was able to deduce a value for m/e which, quoting from the final words of the lecture, was "of the same order as the value 10^{-7} deduced by Zeeman from his experiments on the effect of a magnetic field on the period of the sodium atom"

Italian Polar Research Institute

A NEW polar institute, Istituto Geografico Polare, has been formed in Italy under the directorship of Dr. S. Zavatti. The *Polar Record* for January-July announces that the aims of the institute are: (1) to widen knowledge of all polar areas; (2) to encourage interest in polar affairs in Italy and to publish Italian contributions to polar knowledge; (3) to form a polar library; (4) to publish a monthly periodical, *Il Polo*; and (5) to publish maps of scientific value on polar regions and a series of "Polar Classics". The first number of *Il Polo* came out in February 1946. The address of the new institute is Istituto Geografico Polare, Porto Potenza Picena, Macerata.

Pathogenicity of *Aspergillus nidulans*

THERE are numerous reports in medical literature of infection of man and other animals by species of the fungal genus *Aspergillus*. Pathogenicity of *A. fumigatus* is comparatively well known, and *A. nidulans* has occurred in circumstances which seemed to implicate it as a cause of disease. Dr. Charles H. Drake has studied the latter species in a recent paper (*Mycopathologia*, 4, Fasc. 2, pp. 103; 1948). He finds that the fungus is pathogenic to rabbits, causing initially a purulent inflammation with abscess formation. Subsequent injections may give rise directly to tubercles, in which the fungus changes morphologically to give actinomycetoid granules. Cell-sap of *A. nidulans* is not toxic to rabbits, but stimulates the formation of precipitins. This species does not appear to be pathogenic to guinea pigs, which fact might explain some earlier uncertainty about its disease-producing character.

Land-mine Detectors

FOLLOWING a request, received early in 1940, by the Scientific Advisory Committee of G.H.Q. Middle East for work to be undertaken on the design and construction of land-mine detectors, Dr. Lawrence Balls, then chairman of the Committee, together

with Mr. J. H. Cole, and with the assistance of military personnel, produced, and tried out in actual operations, several successful models. In an article entitled "Land-mine Detectors designed at Giza", which Dr. Balls contributes to the June number of *Reme*, the journal of the Corps of Royal Electrical and Mechanical Engineers, details are given of the construction, performance and characteristic features of these land-mine detectors. They were of various sizes, the large models suitable for road clearance, and the smallest for surgical applications, such as shrapnel detection in wounds. The Mark IV design was first used, but was superseded by an original design due to Dr. Balls, consisting of twin search-coils, thus giving double sensitivity. Coils of about 12-in. diameter were found convenient for ordinary field detectors, and of about $\frac{3}{8}$ -in. for surgical use. Operating on the heterodyne principle, a frequency of one megacycle per second proved most useful, with a frequency ratio of two-thirds to produce the audio-frequency beat-note. Segmented screening, twin oscillators, and a low-loss chassis were the three main characteristics of the 'twin' design. The earthed screen surrounding a search-coil was cut, usually, into twelve segments, each segment being separately connected by a thin wire to a central earth on the chassis. The two identical search-coils, mounted together in the same plane, were inductances of separate oscillatory circuits, driven from a single twin-triode valve. Passage of the coils over a metal object caused the beat-note, somewhat lower than middle C, to be altered downward by one coil and upward by the other, thus causing the headphone note to change suddenly from a progressively lowering growl to a falling high shriek as the object passed from one coil to the other. The weight of a one-man detector is naturally a matter of practical importance, and a prototype, of which two copies were flown to Britain in 1943 but too late to be considered for production, and which was made of wax-boiled wood though designed for production in plastics, weighed only 14½ lb., of which the batteries accounted for more than half.

Mathematical Tables for Science and Industry

THE lack of the relevant mathematical tables for investigations in the physical, chemical and engineering sciences, in mathematics and in industry may well delay progress, and steps are being taken to meet the difficulty. Much work in this field has been done, and tables of a fundamental nature have been produced by the British Association through its Mathematical Tables Committee. These activities have now been transferred to the Royal Society on the invitation of the British Association, and a special Royal Society Mathematical Tables Committee has been established to continue and extend the earlier work. The Committee would be glad to receive suggestions from industrial research groups, from individual investigators and from Service departments relating to existing needs in their special fields. Requests for assistance may be met either by advice as to the most economical way of producing the desired tables, or by an undertaking to produce the tables under the auspices of the Royal Society, or, in exceptional cases, by a grant towards the cost of tabulation or to make possible the publication of important tables which may exist only in manuscript. In the first instance inquiries should be addressed to the Assistant Secretary, Royal Society, Burlington House, London, W.1.