

Wave Filters

By Dr. L. C. Jackson. (Methuen's Monographs on Physical Subjects.) Pp. vii+107. (London: Methuen and Co., Ltd., 1944.) 4s. 6d. net.

THE wave filter is the fundamental necessity of all telecommunication work which is not simple telephony. Carrier-telephony and voice-frequency telegraphy, which enable us to pass tens or even hundreds of times the quantity of information the basic systems permit, could not exist without the wave filter. The basic theory dates only from Campbell some thirty years ago. Since then, Zobel, Shea, Starr, Cauer, and many others have derived alternative methods of approach and practical schemes for arriving at economic designs of filters which are to fulfil more exacting conditions of operation.

The incorporation of quartz crystal elements as lowly damped resonant circuits gave a new degree of freedom in design, and permits the union and separation of hundreds of telephonic channels on a single circuit. The attainment of electrical recording for gramophone disks, and the perfection in so far as it was possible in the so-called acoustic reproduction of records, both resulted from applying what had been solved for electrical circuits to mechanisms intended to operate over a wide range of frequency. Acoustic filters for attenuating specific frequency-bands also followed along the same lines.

The difficulty for a student approaching the subject is either the mass of information contained in the standard text-books, or the skeleton data provided in handbooks or in single chapters in texts on wider subjects of electrical communication or radio. The present author tries to meet the student by outlining the above-mentioned subjects, with just as much theory as will give the student confidence in using any of the great mass of formulæ available in the actual production of filters. The author does not treat at any length the usage of filters in practice, for example, the impedance conditions which are imposed when filters are used in parallel, or any special conditions imposed by the association of filters with modulators. In the space available in these excellent monographs, the author has presented the subject in concise and readable terms, and if there is nothing original, the assistance which he affords the student of filters is ample justification.

L. E. C. HUGHES.

The Subject Index to Periodicals, 1942

Issued by the Library Association. Pp. x+175. (London: Library Association, 1944.) 77s. net.

THE seventeenth volume of "The Subject Index to Periodicals" covers the year 1942 and presents no new features. It is compiled on the plan of the 'dictionary catalogue', articles being entered under specific headings in alphabetical order. The principle is not carried to inconvenient extremes; for example, articles on the individual vitamins are collected under vitamins and are not dispersed under their respective names, while cross-references play an important part in linking up related subjects. Explanatory matter in square brackets is often added where the titles do not sufficiently indicate the subject. The preparation of the "Index", as formerly, has largely depended on the vast resources of the British Museum, while from September 1940 until October 1943 the editor and his staff were accommodated in the National Library of Wales, Aberystwyth. With some important exceptions, in-

cluding, for example, *NATURE*, *Engineering*, the *British Medical Journal*, periodicals covered by the *Agricultural Index*, *Engineering Abstracts*, *Index Medicus*, *Journal of the Royal Society of Arts*, *Petroleum Institute Abstracts*, *Photographic Abstracts*, *Science Abstracts*, *Journal of the Textile Institute* and the *Royal Meteorological Society Bibliographies* are not indexed; but scientific workers will find the "Index" a useful means of picking up signed articles on scientific subjects in leading general periodicals, as well as in tracing authoritative articles on a wide range of social and economic problems, education, reconstruction, etc., in the leading reviews and periodicals.

Reports of the Progress of Applied Chemistry

Issued by the Society of Chemical Industry. Vol. 27, 1942. Pp. 546. (London: Society of Chemical Industry, 1943.)

THE progress of applied chemistry, as illustrated by publication during 1942, is summarized by this report, which conforms to the established pattern. The following fields are reviewed: general, plant and machinery; fuel; gas, destructive distillation, tar and tar products; mineral oils; intermediates and colouring matters; fibres, textiles and cellulose; pulp and paper; acids, alkalis, salts, etc.; glass; ceramics, refractories and cements; iron and steel; non-ferrous metals; electrochemical and electro-metallurgical industries; fats, fatty oils and detergents; plastics; resins, drying oils, varnishes and paints; rubber; leather; soils and fertilizers; sugars and starches; the fermentation industries; foods; fine chemicals and medicinal substances; photographic materials and processes; sanitation and water purification.

Great activity in the direction of synthetic chemical production by the petroleum industry is noted. Magnesium at 1s. per lb. is, if measured by volume, cheaper than aluminium at 7½d. per lb., and its use in aircraft construction is substantial. With reference to the potentialities of the electrochemical and electro-metallurgical industries, it is estimated that in the British Empire some 107 million horse-power of water-power is available, and that of this only about 6 per cent has yet been developed. Progress in the soilless culture of plants is briefly summarized, and this technique of commercial food production is considered to possess every prospect of success. The blackening of potatoes is attributed to hydrolysis of an iron complex which is said to result from growth in soil deficient in potassium but rich in nitrogen.

Health and Hygiene

A Comprehensive Study of Disease Prevention and Health Promotion. By Lloyd Ackerman. Pp. xii+895. (Lancaster, Pa.: Jaques Cattell Press, 1943.) 5 dollars.

THE scope of this book is very wide. In providing a guide to the layman for the proper regulation of his mental and physical life, the author runs riot from physiology to psychology with nothing missed in between. It is doubtful if anyone could ever plough his way entirely through to the end, although this would certainly be an enlightening task. As a book of reference, a modern 'home doctor', this one has much to recommend it. The advice is always sound and common sense, and the explanations are clear and simple. Teachers, medical men, or lecturers preparing talks on any branch of hygiene for youths or adults would find here much useful and relevant information.