

edition. The series has been designed to present in simple and, so far as possible, non-technical terms the essentials of each branch of the subject, so that it might be of practical service to all who are interested in the motor-car. With this aim in view, its principal features have been descriptions and explanations of the construction and operation of the several parts of the car. Theory has only been introduced to a limited extent, and in the present volume a short introduction puts the reader in possession of the main points as to the theory of carburation, the chemical and thermal properties of fuels, and the process of combustion. Starting from the simplest types of carburettor, the author builds up a picture of the development of this delicate piece of apparatus as further and further improvements were indicated by the need of greater economy and smoother running of the engine. He retains descriptions of older models because they embody important and interesting principles.

Of up-to-date types a large number are illustrated and described, and among the more recent developments dealt with are the various types of British and foreign carburettors having original systems of mixture compensation, automatic air chokes, acceleration pumps, power jets and other special features. The subject is treated very broadly, as, in addition to those for motor-cars and motor-cycles, carburettors for aircraft are also included, so that with the chapters treating of such ancillary matters as air cleaners, fuel feed systems, design of inlet manifolds, vaporization and testing, tuning and trouble tracing, the information given is very complete of its kind. In its extended form it should continue to prove of great help to motorists, repairers and students and to enjoy a full measure of popularity.

#### Theory of Alternating-Current Machinery

By Alexander S. Langsdorf. (Electrical Engineering Texts.) Pp. xviii+788. (New York and London: McGraw-Hill Book Co., Inc., 1937.) 36s.

THIS large volume is devoted solely to the theory of the steady state of electromagnetic A.C. machinery (thus excluding electronic devices such as mercury arc rectifiers). Questions of design are touched only so far as they form the background from which the theoretical problems arise. The wide field thus available enables the author to adopt a comprehensive and at the same time broad and easily readable treatment. A specially commendable feature of the book is that the usual analysis by means of vector diagram and complex algebra is always preceded by a very full discussion of the physical relations. In this connexion the chapter on asynchronous machines, which can well be read independently of the rest of the book, should be of special interest to students.

Other noteworthy features of the book are: in the introductory part a special chapter on the theory of polyphase current systems which includes an introduction to the method of symmetrical components, in the treatment of the transformer a discussion of the transformer with three windings, and

in the chapter on synchronous machines a simplified presentation of the Doherty-Nickle theory for the calculation of armature reaction in machines with salient poles. The book can be thoroughly recommended.

A. B.

#### Autographic Indicators for Internal Combustion Engines

By J. Okill. Pp. 88. (London: Edward Arnold and Co., 1938.) 5s. net.

THIS is a subject which has been somewhat neglected and, as a result, connected information regarding the use of indicators on internal combustion engines is not readily obtainable. The author, who designed that most useful instrument, the Okill maximum pressure indicator, has given the matter much study and, in this monograph, presents a range of information and suggestions which should be most acceptable to those who have not had an extensive experience in the manipulation of these instruments. His survey is limited to the combined piston, spring and pencil-lever types, and traces their development from the original instrument devised by Watt about 1790 to the very carefully proportioned and accurate types now made to suit the severe requirements imposed on them by high-speed internal combustion engines. The possibility of inaccuracy and distortion of diagrams arising from piston friction, overheating and mishandling are pointed out and the methods of testing and calibrating the pencil movements are described. Then after dealing with inertia effects, spring vibrations and the correct forms of connectors, operating gears and other details, a number of present-day instruments are described and explained. The book should therefore be a most useful guide to the many engineers who depend on the indicator for periodical information as to how their engines are operating.

#### Automatic Telephony

By Charles W. Wilman. Second edition, thoroughly revised and reset. Pp. viii+208. (London: The Technical Press, Ltd., 1938.) 10s. 6d. net.

AUTOMATIC or machine switched telephony is a very specialized subject; but the fundamental principles can be easily grasped. Few relevant text-books indicate these principles without confusing the student with circuit complexities; the author does provide a readable introduction both for students who intend to go further in their studies of the subject and for those who have to include an outline in their general study of electrical communication. The extensive study of the subject is not to be recommended to anyone who has not a suitable flair for the peculiar but necessary diagrammatic nomenclature.

One is surprised that the author does not give a technique for studying complicated switching problems; some form of pictorial shorthand is always used by engineers when studying machine switching circuits or devising new ones. There is likewise no complete circuit, such as a complete call through the minimum of a line-switch and selectors, or a director,

so that the student can have the mental exercise of seeing how the elemental functions, each clearly described with circuits, operate in concord and with economy of apparatus. One would have liked more details of some of the other automatic switching systems in use. We are committed to a Strowgor-director system in Great Britain, but other systems, such as the rotary, have special advantages, and are, in fact, largely manufactured here for export. The proportion of telephones in Great Britain which are operated by machine switching is high and is increasing, and no student of electrical engineering can be without some knowledge of the basic ideas. There is little scope for young engineers in automatic telephony, but the inherent principles are widely applicable in many other directions, such as remotemetering and control, traffic-lights, and signalling schemes of all descriptions.

L. E. C. H.

### Mathematics

#### Solid Mensuration

With Proofs. By Prof. Willis F. Kern and Prof. James R. Bland. Second edition. Pp. vii + 172. (New York: John Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1938.) 10s. net.

THIS is practically a new book although a second edition, for not only is it more than twice the size of the original edition, but substantial alterations have also been made in the text by the authors. After an introductory chapter giving suggestions for practical computation and a clear summary of plane mensuration, lines, planes and dihedral angles are dealt with. Then follows a good course on solids of uniform section, pyramids and cones, frusta, prisms and the sphere. Later come the theorems of Pappus without proofs and a consideration of polyhedra. Finally, the general prismatoid is discussed and a proof of the prismoidal formula given.

The book is thoroughly well illustrated by clearly drawn figures—a very essential feature for any book on mensuration—and there is an abundance of interesting exercises with a practical bias, including a good set of review problems.

#### Les géométries

Par Prof. Lucien Godeaux. (Collection Armand Colin: Section de mathématique, No. 206.) Pp. 215. (Paris: Armand Colin, 1937.) 15 francs.

PROF. GODEAUX'S addition to this excellent series of popular monographs, will be found of interest to the general reader and to the specialist. The former will be made familiar with the fundamental concepts of the various types of geometry; and both will learn much about their historical and methodological background. The six chapters of this work deal respectively with elementary geometry, analytical geometry, projective geometry, the principles of geometry, the theory of groups and topology. The mathematical notation used is quite simple, and the book makes easy reading owing to the explanations covering all the difficult intuitions of the geometers.

T. G.

### Medical Studies

#### Research in Medicine and other Addresses

By Sir Thomas Lewis. Pp. viii + 75. (London: H. K. Lewis and Co., Ltd., n.d.) 5s. net.

THIS book contains a collection of addresses delivered by Sir Thomas Lewis on various occasions, including the Harveian Oration on "Clinical Science" to the Royal College of Physicians, London, 1933, and the Huxley Lecture on "Clinical Science within the University", at the University of Birmingham, 1935, and all first published in the *British Medical Journal*.

During the last twenty years, Sir Thomas Lewis has made outstanding contributions to medicine dealing with disorders of the heart and circulation.

In the preface to this volume, Sir Thomas says that in his earlier days, when working upon physiological problems, he came to the belief that the problems daily encountered in hospital wards, despite their complexity, are capable of solution by a similar form of investigation, that is, by the experimental method directly applied to man, and he tells us that he has never wavered in this belief and that all his later experience has confirmed it. Actually, this method in Lewis's hands has yielded rich results. A second motif running through these addresses is the hope that a science of medicine might develop through the freeing of investigators from the necessity of earning a livelihood by practice. At the end of his Huxley Lecture he says: "It is my conclusion that it is largely within the power of our universities to establish the branch of work that studies disease in living people as a science, by removing the obligation to engage in and teach the practical art, and by treating Clinical Science on precisely the same basis as the allied sciences, physiology and pathology, are treated, thus bringing all the work into real harmony".

Sufficient has been said to indicate the content of these addresses, and many will probably agree that Sir Thomas has established his thesis.

#### The Health of the Nation and Deficiency Diseases

By John Maberly. Pp. xi + 118. (London: Baillière, Tindall and Cox, 1938.) 5s.

THE author maintains that the physique of the younger generation has steadily declined during the last twenty years in spite of improvement in hygiene, labour conditions, and provision for unemployment and sickness as well as for clinics for child welfare. He attributes the ill-health which is prevalent among a large section of the people, especially in the form of neurasthenia, to partially deficient diets resulting from the present methods of milling wheat and the making of white bread. According to him, the vitamins B and E, as well as iron, iodine and copper, which are contained in adequate amounts in wheat but are either wholly or very largely confined to the germ and cortical layers of the grain, are excluded in the ordinary white bread. He therefore recommends an absolute