

method of solving the unsteady-state conduction problem receives prominent attention; but no mention is made of other methods of tackling these problems. The Fourier analytical solution of the general unsteady-state equation is omitted. On the other hand, the application of the theory of similarity to heat-transfer problems is presented mathematically, but only in a manner which will conceal its importance from the reader not well equipped in that direction. The radiation of both non-luminous gases and luminous flames is not dealt with.

Notwithstanding these criticisms, there is a vast amount of careful, clear and painstaking explanation of various aspects of the subject. The more advanced sections, however, are open to the criticism that usually the German method of treating the various problems is given: however excellent, a comparison with methods more familiar in Great Britain would be valuable. In general, the book follows many others of Continental origin in appearing to imply that any reasonably competent person reading from the beginning to the end can become an expert in the subject, whereas in actual fact all too many find they have a ceiling beyond which they cannot rise. There is no indication to such as to which are the important points.

Summing up, it may be said that this is a valuable and useful contribution to the literature of the subject in the English language, if read in conjunction with other books or under suitable guidance.

A. L. BIRD

GAS TURBINES

The Theory and Design of Gas Turbines and Jet Engines

By Prof. E. T. Vincent. Pp. ix + 606. (London: McGraw-Hill Publishing Co., Ltd., 1950.) 64s.

IN a world already sated with technological literature, if an author feels it impossible to resist the urge to go into print, it is surely his first duty to be as concise as possible. A student to-day has not the time to separate out the essentials and the irrelevancies in a text-book. The gas turbine is a particularly suitable subject for the practice of precise writing, for, in the elementary forms in which it should be presented to students, it is one of the simplest heat engines that can be conceived. It should be possible to convey the essential facts about it in some two hundred pages of normal text-book size.

The author of this book, however, has decided to leave nothing to chance and plugs away at his subject for three times as long. By the time he is through, the exhausted reader, in addition to having a miscellaneous collection of basic formulæ in his head, has had to absorb a mass of irrelevant details of obsolete engines. This practice of mixing up the fundamentals of a subject with examples of current or out-of-date applications of the fundamentals and with details of practical points connected with the operation of the main and ancillary machinery is a common fault in modern text-books. In fairness to the author, it must be added that this book is certainly no worse than many others on the same subject.

The book is at its best when dealing with the straightforward dynamics of flow in compressors and turbines, although much of the material appears to have been taken almost bodily from the author's sources. The chapter on combustion consists mainly

of a description of existing chambers and techniques, with little of the underlying theory. Chapters are also included dealing with jet propulsion, in which the arithmetic of the propulsive jet is very fully presented; with materials, including miscellaneous data on a number of materials, some of which are of interest to engineers at the present time; and with regenerators, in which some useful formulæ for calculating heat flow are given without really getting down to the kernel of the heat exchanger problem. The book would gain very greatly if the author had given physical explanations of the phenomena occurring instead of usually remaining content with presenting the bare mathematical equations.

The standard of gas-turbine text-books is so very low that, in spite of the hard words written above, this book is probably one of the best so far produced on this subject. But we still have to wait for a work on the gas turbine equivalent to D. R. Pye's classic volumes on the internal combustion engine.

H. CONSTANT

SCIENCE AND LITERARY CRITICISM

Science and Literary Criticism

By Prof. Herbert Dingle. Pp. viii+184. (London and Edinburgh: Thomas Nelson and Sons, Ltd., 1949.) 7s. 6d. net.

THE author has performed a valuable service in writing this short but stimulating book. It divides naturally into two parts: the first debates the question as to whether a science of criticism is possible—and the short answer is "scarcely"; whereas in the second, some illuminating comments are made on the work of three poets to illustrate the way in which a scientific *Methodik* might help.

Although Prof. Dingle does not remind his readers that a 'poet' originally meant a 'maker', it may be hoped that they will recollect this derivation and keep it before them, for it adds weight to these penetrating analyses of Wordsworth, Swinburne and Browning. It is no use, we are told, to revel in the beauty of a poem if we would try to be critics: we only discover ourselves that way, and not the poet. Wordsworth sought happiness first—a blissful enjoyment impervious to detail. Such an outlook is not inconsistent with his idea of truth, which is more akin to dreaming than to intellectual veracity.

By contrast, the problem of Swinburne is to discover his 'vectors' which point outwards from his 'internal centre', about which, aforesaid, Meredith and Mrs. Meynell were rather unkind. It is seen, however, to be an exceedingly complex phenomenon, connected in some way with a passion for the infinite. In this context, the contrast with Shelley's psychological constitution is well brought out.

Finally, the intellectuality, or its absence, of Browning is reviewed, and it becomes manifest that the reply to the query whether he was scientific is "definitely not".

Much of all this is applicable to the arts in general: for example, Browning's incapacity to generalize puts him, in this respect, in company with Leonardo da Vinci who, in spite of his inventive powers, lacked scientific, and still more mathematical, ability in the fundamental sense. Such matters will interest a wide circle, and this scholarly contribution deserves the warmest of welcomes.

F. I. G. RAWLINS