are used in railway work, and the Lanchester machines for the testing of worm gears. Other sections deal with lubricants, friction tests on bearings, vibration tests, and static and dynamic balance.

The part of the volume devoted to tests on structural elements contains methods of testing concrete slabs and beams, plain and reinforced, and also columns of various types. Much of the work which has been done on this subject has been carried out in America, and we note that the authors have dealt justly with it in the space at their disposal. Tests on cutting tools, aircraft models, and other miscellaneous tests conclude the volume. As was the case in the first volume, a good deal of the apparatus described is installed at the National Physical Laboratory, but the authors have not forgotten that research cannot be confined to one place, nor to one investigator or group of investigators. The complete treatise will be welcomed by all who are engaged in the testing of engineering materials and appliances.

(1) *Oil Power*. By S. H. North. (Pitman's Common Commodities and Industries.) Pp. ix+122. 3*s*. net.

(2) *Internal-Combustion Engines*. By J. Okill. (Pitman's Common Commodities and Industries.) Pp. xi+126. 3*s*. net.

(3) *The Diesel Engine*. By A. Orton. (Pitman's Technical Primers.) Pp. x+111. 2*s*. 6*d*. net.

(London: Sir Isaac Pitman and Sons, Ltd., 1923.)

THE general reader who desires information regarding oil fuel and the practical methods of using it will find much of interest in these three little books. The greater part of (1) is occupied with descriptions of oil burners as used in furnaces. This system is employed to a large extent in marine and locomotive boilers. The question of oil storage at various ports is of vital importance for the supply of oil-fired vessels, and is dealt with towards the end of the volume. The first thirty-two pages in (2) are devoted to the gas engine, and the greater part of the remainder deals with oil engines of different types. The book is up-to-date in the matter of the engines selected for description, and there are sections on aero-engines, tractor engines and turbines. The Diesel engine is of sufficient commercial importance now to warrant a separate volume, and this is provided in (3). Here we find descriptions of the arrangements and methods of working of both four-stroke and two-stroke Diesel engines, and a short discussion of the power developed and the efficiency. The student of heat engines will of course require a great deal more than is contained in these books. They are, however, very suitable for those readers who wish to be informed as to what has been accomplished in this important branch of engineering.

British Museum (Natural History). British Antarctic (Terra Nova) Expedition, 1910. Natural History Report. *Botany*, Part 3: Lichens. By O. V. Darbishire. Pp. 29-76 + 2 plates. (London: British Museum (Natural History), 1923). 7*s*.

DR. DARBISHIRE'S account of the lichens is the third of the reports to be issued on the botany of Captain Scott's Antarctic expedition of 1910. Reports on the seaweeds (by Mr. and Mrs. Gepp and Mme. Lemoine) and on the freshwater Algæ (by Dr. Fritch) were published in 1917.

Seventeen species were collected, eight of which proved to be new, and are described and figured in the present publication. With the exception of one Lecidea, the new species belong to the genus Buellia. The lichens were all found on rocks, mainly granite and gneiss, at Cape Adare and Evans Cove in South Victoria Land. When describing the lichens brought back by the Swedish Antarctic Expedition (1901–3) in 1912, Dr. Darbishire gave a summary of the species known at that time from the Antarctic area; their number was 107; this has now been increased to 208, mainly by the material brought back by the second French Antarctic Expedition of 1908–10, which was reported on by the late Abbé Hue. The value of the present brochure is enhanced by the inclusion of a complete list of the species recorded from the Antarctic area, that is, from localities to the south of the 60° S. parallel, to which are added keys to the genera and species. Twenty-three per cent. of the species are also found in the Arctic regions, and the author notes a striking similarity of the Arctic and Antarctic lichen flora in regard to the proportion among the known species of the chief lichen forms.

The Preparation of Plantation Rubber. By S. Morgan. With a Preface and a Chapter on Vulcanisation by Dr. H. P. Stevens. Pp. xvi+331. (London, Bombay and Sydney: Constable and Co., Ltd., 1922.) 21*s*. net.

BOTH editions of Mr. Morgan's useful book on plantation rubber are now out of print, and in preparing a third edition the opportunity has been taken to revise completely the original work, and to incorporate in the new volume the results of the experimental research in practically all branches of the business of preparing rubber for the market which has been carried out by Mr. Morgan in the course of his work as Scientific Officer to the Rubber Growers' Association in Malaya. In doing so, the book has been virtually re-written, and it now forms a complete and authoritative guide to the modern practice of a rubber plantation, from the planting of the tree to the packing of the rubber for export. The subject has been usefully rounded off by the addition of a series of three chapters on the vulcanisation of rubber, including an account of the methods of testing the material for industrial use. This section of the book has been specially written by Dr. Stevens, consulting chemist to the Rubber Growers' Association in London, and is based on the researches on vulcanisation carried out by him for the Association over a period of about ten years. Altogether the volume is an admirable handbook, and with periodical revision should remain the standard work on the subject.

Die Stereoskopie im Dienste der Photometrie und Pyrometrie. Von Carl Pulfrich. Pp. iv+94. (Berlin: Julius Springer, 1923.) 3*s*. 4*d*.

THE physiological optical effect on which the photometrical method made use of in the instruments described in Prof. Pulfrich's book is based was described in NATURE of May 12, p. 648, and May 19, p. 691. In one of Prof. Pulfrich's instruments a pair