engine, and the pages dealing with leakage to exhaust are very good.

The testing of internal combustion engines is an up-to-date review of work which is being done by the British Association Committee, and also includes gas producers, the Diesel type, &c. The chapter on refrigeration tests is helpful, but, as the author would probably admit, it is very difficult to get all the conditions steady enough to make the tests as satisfactory as could be wished. The testing of water-turbines and pumps complete the book, which is the more valuable for a carefully compiled index at the end. As we stated above, it is a book which is needed, and we can heartily recommend every student to place it on his work-desk. It is comprehensive, but it deals very thoroughly with the most general types of engines and boilers. The illustrations are good and plentiful, and we conclude by congratulating the author on producing such a practical treatise.

A. J. M.

GROWING OUR OWN SUGAR.

Sugar Beet: Some Facts and Some Illusions. A Study in Rural Therapeutics. By "Home Counties" (J. W. Robertson-Scott). Pp. xx. + 424. (London: Horace Cox, "Field" Office, 1911.) 6*s.* net.

THIS work is based largely upon articles published in *The Field* and *The Times* during the years 1910–11, and is essentially an examination of the arguments for and against the proposals to establish a beet sugar industry in this country. "There are those," the author remarks, "who hail sugar beet as the saviour of the countryside; and there are those who are sure that the notion of growing our own sugar at a profit is preposterous." For each of these classes he has collected a large number of "facts," and to some of the former he indicates what in his judgment are "illusions."

That sugar beets can be grown here, and of as good quality as on the Continent, hardly needed demonstration. What did require investigation was whether, in all the circumstances, it was worth our while to do it.

The author examines this question step by step. He describes the chief experiments that have been made in this country, from the Lavenham venture some forty years ago to the East Anglian trials made under Dutch auspices in 1910. In these trials, it may be mentioned, more than three hundred acres were planted with beet intended for exportation to Holland, and the quantity registered as actually exported was 3909 tons. This weight, however, is untrustworthy, as it includes a large proportion of adherent soil. The factory purchasing the roots pays upon the weight of the cleaned beets only; and heavy deductions had to be made from what the farmers supposed to be the weight of their crops. Probably one of the "illusions" indicated in the title arose from calculations based upon a crop yield which, for the reason mentioned, might be over-estimated as much as 10 to 50 per cent. Whilst average crops of more than 20 tons per acre have been talked about in this country, the cold fact remains that on the Continent in 1910 the average yield ranged from 9·3 tons in France to 13·3 tons in Germany.

For various reasons the East Anglian experiments were only moderately successful. The causes of this are indicated; and the author compares the results of these and other English efforts with the teachings of practical experience abroad. He quotes numerous reports, and generally gives chapter and verse for his carefully guarded conclusions. These are, briefly, that a cooperative factory, growing its own beets, or a large proportion of them, would have the best chance of success; but that an ordinary factory, established after careful investigation, under good management, and with proper support from farmers in the vicinity, would have fair prospects; also that the introduction of the beet sugar industry would help in bringing about in rural England changes of some value agriculturally and sociologically, and is deserving therefore of sympathetic study. Owing, however, to the developed condition of our agriculture, and also to the increasing competition of cane sugar, the benefit in England would not be likely to equal that obtained on the Continent.

Of purely scientific interest there is very little in this "study in rural therapeutics"; but from the agricultural point of view it ought to do a good deal towards clearing away misconceptions.

C. S.

COLLOIDS IN INDUSTRY

Die Bedeutung der Kolloide für die Technik. Allgemein verständlich dargestellt von Prof. Kurt Arndt. Zweite Auflage. Pp. 46. (Dresden: Theodor Steinkopff, 1911.) Price mk. 1.50.

ALTHOUGH it is fifty years since the distinction between colloids and crystalloids was first drawn by Thomas Graham, it is only quite recently that the conception of colloid substances has been extended beyond the ranks of a few specialists to possess some meaning for the public at large. Almost as recent and remarkable in its suddenness has been the feverish eagerness with which the properties and behaviour of colloids have been investigated. In Germany, there are several journals devoted entirely to colloid chemistry, as well as text-books of every variety.

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