

characteristics of railway motors, upon the design of which Mr. Hobart is an acknowledged authority. Throughout the whole of this section a liberal use is made of graphical methods, and a number of curves referring to the energy consumption under different conditions in actual practice is given.

Chapter v. deals with the generating plant, and is, in our opinion, so far as the practical value of the information contained is concerned, scarcely so useful as the rest of the book; considerable space is devoted to descriptions of tramway generating stations, which, however up to date at the time of construction, are hardly representative of the most modern practice. The question of power-station design is a subject of its own, and is not one upon which the railway engineer, pure and simple, is often called upon to express an opinion. A design is given, however, of a proposed 10,000-kilowatt station, but, so far as can be judged from the drawing, the "complete unit" system by which, for safety reasons, the plant and buildings are entirely subdivided does not appear to be recommended. Interesting tables of the comparative cost and annual over-all efficiencies of various generating stations are given.

A chapter upon the transmission of the electrical energy calls for no particular comment; sections of the cables adopted on various railway systems and the sizes of such cables are given. Particulars are also given of the cost of these cables, but the value of this is, of course, greatly dependent upon the price of copper. Substations are next dealt with, details being given of a very large number of actual substations used in railway work.

Chapter viii., dealing with the distributing system, in other words the third rail, is of more interest, and contains a number of tables dealing with recent practice in this connection; overhead work is also illustrated, though not so fully as could be wished.

Part iii. deals with rolling-stock, and is replete with illustrations and working drawings of locomotives and carriages. This portion of the book, however, shows signs of haste in editing, and in future editions we would suggest that the efficiency curves of motors which it contains, and, in fact, the reference to motors generally, should be gathered together in one section, namely, chapter iv., where most of them are already to be found, instead of being again dealt with under locomotives; certain of the data of rolling-stock given in chapter iv. would, in our opinion, be more easily found in the chapter which is specially devoted to that branch.

These are, however, minor criticisms. The work is one of great practical value to all railway engineers, and will be further enhanced if in future editions more actual illustrations of the total costs of operation of electrified steam railways can be furnished. The North-Eastern Railway, the Lancashire and Yorkshire, and the District Railways have all been in operation long enough to furnish data of the greatest commercial value.

The general "get up" of the work is excellent, as are the reproductions of the various drawings.

OUR BOOK SHELF.

L'Année technique, 1906. By A. Da Cunha. Pp. xii+237; illustrated. (Paris: Gauthier-Villars, 1906.) Price 3.50 francs.

SINCE 1901 the author has each year prepared in attractive form a concise summary of recent progress in engineering, and his series of volumes cannot fail to prove of inestimable value to the student of French industrial history. His annual summary is not a mere compilation of disconnected notes, but a collection of essays written with originality, technical knowledge, and literary skill.

The subjects dealt with in the record for 1906 comprise accidents in works, the heating and water-supply of houses, public works, and locomotion. A museum illustrating the prevention of accidents in works having recently been inaugurated at the Conservatoire National des Arts et Métiers, Paris, the author has seized the opportunity of dealing at some length with the subject of industrial hygiene, and describes the museums that have been established with the object of bringing to public notice the arrangements that have been found by experience adapted for the protection of workmen in various industries. Museums of this kind exist at Zurich, Amsterdam, Vienna, Munich, Berlin, and Paris. The problem of efficaciously heating dwelling-houses is one that has long been under consideration. The old French fireplace, in which, it has been said, the hottest place is at the roof, has been superseded by modern fireplaces, by fixed or movable stoves, and by heating with steam or hot water.

Many ingenious improvements are described by the author, who also gives some useful advice on this important topic. Other interesting subjects dealt with include the installation of the huge compressed-air caissons for the passage of the Paris Metropolitan Railway under the Seine, the recent developments in automobile transport, and locomotion on ice and snow. The numerous illustrations have been carefully chosen and well executed, and the volume is produced in an attractive style at a modest price. Mr. Alfred Picard contributes a preface, which, like the rest of the volume, may be studied with profit and pleasure, not only by the engineer, but also by the general reader desirous of acquainting himself with the events of the day.

Diseases of Fruit and Fruit-bearing Plants. (Board of Agriculture and Fisheries.) Seven diagrams and text. (London: Printed for H.M. Stationery Office by Darling and Son.)

THE Board of Agriculture and Fisheries has issued a series of seven small coloured diagrams illustrative of a number of common diseases met with in cultivated plants, especially those which are grown for the sake of their fruit. They are adapted for use in schools in the country districts. They illustrate the general appearance of the diseased fruits, without any botanical details. Indications are given as to the best methods of prevention. The use of Bordeaux mixture is frequently and judiciously recommended, but no instructions are given as to the way in which the mixture should be prepared. It is certain that, in spite of the publicity which has been given to this excellent fungicide, many cultivators do not yet know how to prepare it. The use of liver of sulphur is also recommended, but the caution is not added that it should not be allowed to come in contact with the paint on frame or greenhouse so as to prevent the discoloration that would otherwise ensue.

No attempt is made to indicate the degree of injury inflicted by various fungi; thus the first of the series, the "strawberry leaf-spot," is of very little conse-