

OUR BOOK SHELF.

Machine Design. By Prof. Charles H. Benjamin. Pp. vii+202. (London: Archibald Constable and Co., Ltd., 1907.) Price 8s. net.

FEW men are more qualified to speak with authority upon the experimental side of machine design than the author of this little book. Indeed, we are inclined to the opinion that it might well have been entitled "Experimental Machine Design," since it deals almost exclusively with Prof. Benjamin's classical experiments upon the behaviour of certain machine parts when tested to destruction. Our general opinion of the book can be summed up in a very few words—"excellent as a sample." We trust, however, that it is but a sample of what the author intends to give to the engineering world in the near future.

Regarded, however, as a general treatise on machine design, we are bound to confess that it is somewhat disappointing, since such a very small portion of the book is devoted to the correct proportioning of even the commonest constituent parts of machinery. The faults of the book are faults of omission rather than of commission; to a large extent the matter given is original and cannot fail to be of great value to designers of machinery. The analytical treatment of some of the problems dealt with is both new and ingenious.

We have noticed a few slips, but they are mostly unimportant. On p. 6 the modulus of elasticity for crucible or tool steel is given as 40,000,000 lb. per square inch. We have tested a great many specimens of such steel, but have never obtained a value of more than 32,000,000 lb. On pp. 11 and 74 the torsion modulus of a square shaft is given as $d^3/4 \cdot 24$, but according to St. Venant, Lord Kelvin and others, this should be $d^3/4 \cdot 81$. The value given for the elliptical section is also in error; it should be $ba^2/5 \cdot 1$.

The experimental investigations of Prof. Benjamin on the bursting strength of cast-iron cylinders, the strength of flat plates, gearing, fly-wheels, and pulleys are of the greatest interest. If only designers of machinery would take to heart some of the lessons taught by these experiments, we should less frequently hear of the disastrous failures of fly-wheels, &c. We trust that he will continue his researches in many directions and incorporate them in a future edition.

On the whole, the illustrations are good. They are clear without giving too much detail, which is so often a fault in many books of this type; but in some instances the diagrams are crude, and are, indeed, incorrect. For example, the stuffing-box shown in Fig. 36 is not such as one would expect to find in a treatise on machine design.

Some of the friction experiments quoted were carried out in a very crude fashion, and the results are liable to be very misleading. For an example of this see p. 107. Except for the minor faults that we have pointed out, we can heartily recommend the book to students and draughtsmen generally.

Flowers and Trees of Palestine. By Miss A. A. Temple. Pp. xii+172. (London: Elliot Stock, 1907.) Price 6s. net.

ARISING out of a tour in Palestine, Miss Temple has compiled for the benefit of other travellers a list of the principal plants of the country. The list, which is arranged alphabetically, furnishes the popular and scientific names, also the localities; certain features of some of the genera and species are added, but they are of little determinative value. Preceding the list are four chapters containing an account of the characteristic flowers, thorny, tropical, and subalpine plants, and of the trees. A number of good illus-

trations are provided which are taken from the author's photographs.

Miss Temple discusses the interpretation of the Biblical names, following as her guides in this matter Canon Tristram and Dr. Post. The interpretations are obscure, although there is unanimity in most cases. The identification of "the lilies" has given rise to controversy. The author favours the view that the flower signified especially as the "lilies of the field," is *Anemone coronaria*; Dr. Post for another reference inclines to the gladiolus; these flowers are more probably signified than *Lilium chalcidonicum* and *Lilium candidum*, which are found, although rarely. It seems unnecessary to introduce *Acanthus* for any reference to "nettles," and Jew's mallow is generally understood to be *Corchorus olitorius* or *capsularis*, not *Corchorus trilocularis*. Otherwise, except for one or two obvious mistakes, the identifications are acceptable. Although the information in the descriptive chapters is slight and lacks continuity, the reader can, with the help of the illustrations and the list of plants, obtain a fair idea of the brilliant nature of the flora, and the traveller should be able to identify the more conspicuous plants.

Familiar Indian Birds. By Gordon Dalglish. Pp. viii+71; illustrated. (London: West, Newman and Co., 1907.) Price 2s. 6d. net.

THAT many persons in India, especially new arrivals, feel the want of an easy means of identifying the commoner birds of the country is indisputable, and this want the author of the booklet before us has endeavoured to supply—largely in the form of reprints from notes in scientific and other journals. In the main, the notices are interesting and to the point; but there appears a lack of judgment in regard to the species selected for mention. The omission of the adjutant stork is a glaring instance of this; while in the section on herons it is obvious that the egret or "paddy-bird" should have figured as the main heading, in place of the ordinary British heron. Then, again, it is a mistake to have selected such birds as the heron, moorhen, and barn-owl as the subjects for pictorial illustration, when so few characteristic Indian species are depicted. Neither can much be said in praise of the illustrations themselves, that of the myna being specially poor. By the time the book reaches a second edition, it may also be hoped that the author will have learnt to write sentences of a more grammatical type than the one standing second in the account of the jungle-babbler, or the third and fourth (taken together) on the seventh page. R. L.

Progressus Rei Botanicae. Vol. i., part iii. Die Fortschritte der Immunitäts- und Spezifitätslehre seit 1870. By R. P. van Calcar. Pp. 110 (533 to 642). (Jena: Gustav Fischer, 1907.)

THE third and final part of the first volume of this publication, issued under the auspices of the International Association of Botanists, is assigned to a survey of the study of immunity, compiled by Dr. R. P. van Calcar. Due credit is given to botanists for the early conceptions of the theory, and the gradual evolution of the subject by pathologists is traced up. The author presents an explicit and critical account of the experiments and views elaborated by Metschnikoff, Ehrlich, and Pfeiffer; he describes the phenomena of agglutination, and discusses the arguments in connection with toxins and antitoxins, the taxonomy of the tubercle bacillus and the rôle of ferments. Although the field has been explored chiefly from a medical point of view, a knowledge of the general theories regarding the action and nature of bacteria is also required by plant pathologists, and the summary is eminently suitable to a botanical publication.