

hand, cover a wider ground, including conversion of degrees into minutes and seconds, squares and cubes and corresponding roots, reciprocals, circumferences and areas of circles, natural functions, logarithms, logarithmic sines, cosines, tangents, cotangents, logarithms of radians, exponential and natural logarithms, radian tables, and constants. Each table occupies two pages only, but "special tables" are given for those parts of the logarithmic and trigonometric scales where the differences are large. The book is well suited for use in the laboratory or examination-room. The author wisely does not follow the usual fashion of introducing unnecessary and superfluous tables of anti-logarithms as well as logarithms. The edges of the pages are cut after the fashion of a "Where is it?" thus facilitating reference. In the trigonometrical logarithms, negative characteristics are used, the functions being thus referred to an arc of unit radius instead of radius  $10^{10}$ , as in the earlier tables.

#### OUR BOOKSHELF.

*Complete Yield Tables for British Woodlands and the Finance of British Forestry.* By P. Trentham Maw. Pp. xii+108. (London: Crosby Lockwood and Son, 1912.) Price 7s. 6d. net.

SIR W. SCHLICH has stated that the most urgent need of British forestry is the collection of statistics by means of which the financial results of the industry can be estimated. These statistics are usually embodied in so-called yield tables, which give for an acre covered with a certain species of tree, and treated in the best manner, the volume of timber, number of trees, their average height and diameter, &c., corresponding to different ages. As the productivity of timber varies with the nature of the soil, a number of qualities of soil must be admitted. Usually three are sufficient—good, medium, and bad soils—and, corresponding to these, three different tables for each species are made. The tables are constructed from a graphic analysis of the data obtained by measuring a large number of sample plots of the given species on all classes of soil and of all ages.

Yield tables are either general, applicable to a whole country, or local, restricted to a small district where climatic conditions are uniform. It is usually admitted that general tables are not trustworthy, and we cannot, therefore, use with safety the German yield tables.

The present volume is an attempt to furnish the necessary yield tables for British practice. His tables, meant to be applicable to all Britain, can only be approximative. They have been constructed by a method which Mr. Maw claims to be new, and explains as follows: "The growth of timber is characterised by certain girth indices and density factors, both of which are interdependent, and which are dependent also on the

height growth; and if these and the height growth at different ages are taken into account, the preparation of yield tables is a comparatively easy matter, and results can be obtained which are approximately correct for all practical purposes."

This theoretical method requires to be tested by comparison of actual woods with Mr. Maw's figures. It is also to be noted that his ideal woods are more heavily thinned from the beginning than the ideal woods of most German tables. This is financially sound if the quality of the timber is not thereby affected; but herein lies great danger. Mr. Maw's tables are ingenious and original, and deserve consideration at the hands of practical foresters.

*Forme, Puissance et Stabilité des Poissons.* By Prof. Frédéric Houssay. (Collection de Morphologie Dynamique. Directeur: Prof. F. Houssay. IV.) Pp. 372. (Paris: A. Hermann et Fils, 1912.) Price 12.50 francs.

THE question of the best form which a body should have so that its resistance shall be a minimum is one which will always attract the scientific mind, and one is naturally inclined to think that in fishes the form that has survived is best for propulsion in water. Prof. Houssay in this new work gives a very complete account of the experiments which he has been making during the last few years on the resistance of fish-shaped forms, partly from this point of view. Curves of power of various forms with and without elastic fins have been obtained by towing them from their leading end. The marked effect of the fins upon the stability and relative resistance to the motion of the forms has been investigated very exhaustively, and some interesting results have been obtained.

By a very ingenious method the author has succeeded in tracing out the stream lines of several fishes, and a very good beginning has been made with the experimental investigation of the power which various fishes are capable of exerting. The author has successfully examined the case of fishes kept almost stationary, and it is hoped that the further experiments which it is proposed to undertake will include some with the fishes moving at different speeds relative to the water.

Quite a large part of the work is devoted to the question of the means of propulsion which the fish possesses, and in particular seeks to differentiate between the action of the main body of the fish, its tail and the fins, and the part which the necessity of these actions has played in giving the fish its form.

G. S. B.

*Heat and Steam.* By Engineer-Lieut. S. G. Wheeler, R.N. Pp. vii+224. (London: Edward Arnold, 1911.) Price 4s. 6d. net.

THE original design of the author of this book was to provide material covering the more theoretical parts of the subject required by naval cadets up to the time of their leaving the training cruisers. While this object has been kept in view, sufficient additional matter has been included to render the book useful to other classes