

of the upper surface of *Coletis* (or *Teracolus*) *amata* is well described as "orange." "Thaxter" on p. 405 is a misprint for Thayer. These, and a few similar slips, are but slight blemishes on a thoroughly useful book.

F. A. D.

THEORETICAL STUDIES IN RELATION TO NAUTICAL SURVEYING.

Hydrographic Surveying: Elementary—for Beginners: Seamen and Others. A Practical Handbook. By Commander Stuart V. S. C. Messum. Pp. xiv+504. (London: C. Griffin and Co., Ltd., 1910.) Price 12s. net.

THEORETICAL considerations dealing with the effect of errors of observation constitute one of the distinctive features of this book. It may be doubted whether such investigations are appropriate to a practical handbook intended for beginners; and in some instances, where they are merely of academic interest, their introduction is unnecessary. The dissertations on the manipulation of the station pointer, for example, are diffuse and of little practical utility. The chapter on the principles governing the selection of objects for fixing positions contains certain theorems which will be of interest to those already familiar with the subject; but beginners would find concise directions as to what goes to make a good fix more helpful to them. The discussions bearing on the "circle of equivalents" bring out a useful fact in a form somewhat different from that in which it has usually been presented. The principle involved is an important one, but it is possible to strain unduly its practical application. So much stress has been laid on it that beginners might easily be misled; the author himself appears to have misapplied the principle on more than one occasion.

This is notable in the example of plotting given on p. 197, where it is suggested to accept an intersection of two lines cutting each other at an angle of a little more than 30° , in preference to an intersection of about 90° . In this case primary points are alone concerned, and the considerations indicated by the author are not applicable. A similar misapprehension is noticeable on p. 201, in the paragraph relating to the projection of check lines from the best lines of reference. It is here implied that in the case of primary points, one of the lines on which they are plotted might have been laid off with a length of radius so short as to vitiate any lines laid off from it subsequently.

The question is discussed at some length as to the best zero to select for shooting up other objects when the position of the observer is not accurately determined. The problem is one of frequent occurrence, and is of great importance, but the treatment it receives is not satisfactory, and is liable to misapprehension. In this, as in some other cases, the broad practical rule of choosing a zero situated at about the same distance as the object to be shot up and making as small an angle with it as possible is not stated; whilst the investigation rests on assumptions not realisable when drifting in a boat or the ship in

an unknown direction, as always happens in practice. In the paragraph on measuring a base by chained portions, the rule of sines is used for solving triangles having one very obtuse angle and two acute angles. The proper method of solving such triangles might have suggested to the author the fact that since cosines of small angles change very slowly, small errors of observation are practically of no account, and consequently that the measurement of the off-set is unnecessary and less accurate than using each separate section of the base as measured.

Other instances of misapplication of theory to practice might be quoted, but those mentioned suffice to indicate a want of appreciation of practical requirements, and suggest the possibility that the author is more familiar with the theoretical study of the subject than with the conduct of a survey.

In discussing the question of false station, there is no reference to the simple method of eliminating all errors from that source by the expedient of observing at equal distances on opposite sides of the true station. There is, moreover, an easier method than that given by the author for calculating the correction for false station.

The use that might be made of a distant peak in connection with the angle of elevation of the mast-head when sounding a shoal has also escaped attention; neither is there any reference to the use of angles of elevation in making a running survey of an island when circumstances admit.

The investigation of the error of parallax in connection with sextant angles, due to the use of the long telescope when reflecting objects close to the observer, is of some theoretical interest, and is worthy of mention. As a matter of fact, the error from this source is not nearly so great as the author assumes, since it only exists in a minor degree with the short telescope which in practice is always used, being more convenient.

The various instruments and the methods of using them are fully described, and the ordinary operations connected with surveys of small extent are given in detail, together with a number of examples of such surveys, besides a useful chapter on amending the details of a chart.

A. M. F.

PRODUCTION OF SEED-OILS.

Linseed Oil and other Seed Oils: An Industrial Manual. By Prof. W. D. Ennis. Pp. xiv+316. (London: Constable and Co., Ltd., 1909.) Price 16s. net.

IN this work the author aims at the production of a manual which will serve as a fairly complete guide for the manufacturer of certain seed oils, more particularly linseed oil. He notes that, with one or two exceptions, the principal publications dealing with this subject hitherto have discussed it chiefly from the chemical standpoint. Accordingly in this volume the chemistry—which, after all, is relatively simple—is subordinated to the manufacturing and commercial aspects of the industry.

The work is written from the American point of