

line of the essential points of plant anatomy and histology, may be regarded as preparatory to the more serious systematic study of the vegetable kingdom contained in section iii. As might be expected, Prof. Bokorny has adopted the Englerian scheme of classification, but reference is made to other systems, the Linnean system being considered, in a special chapter, at greater length perhaps than is desirable at the present day. The greater part of the section is devoted to the principal orders of phanerogams; and in his emphasis of well-chosen points of taxonomic importance and frequent references to plants of economic and biological interest, the author has produced a very clear and readable exposition of a branch of botany notoriously difficult to deal with in a manner which shall arouse and, more especially, sustain the interest of the student.

The question of general morphology is dealt with in the first section of part ii. Both the stage at which this important branch of botany is considered and the relatively small amount of space allotted to it—some twenty pages largely occupied by illustrations—would probably meet with criticism at the hands of most English botanists, and the same may be said with regard to the comparatively little attention paid to anatomy. But the principal features of part ii. are the sections dealing with physiology and ecology. In the latter section the author prefers the primary title of "Biologie der Pflanzen"; the various factors influencing plant life are first considered in some detail, and the actual studies of typical formations are concerned with the vegetation of the earth as a whole rather than with a detailed consideration of more restricted areas, a method more generally adopted in this country.

A feature of the book is the wealth of illustrations with which it is provided. Most of them are familiar friends, but they are drawn from very varied sources, and the inclusion of many of them is a further example of the freshness of conception which has been already commented upon as characterising these volumes.

#### OUR BOOK SHELF.

*Dæmringen i Norge.* By Prof. H. Mohn. Pp. 76. (Christiania: Jacob Dybwad, 1908.)

IN a country which stretches, as Dr. Mohn reminds us, to the 71st degree of north latitude, the times of sunrise and sunset, with the accompanying phenomena of twilight, have a wider significance than with us. There the calendar has to be consulted to find the day when the sun will first appear above the horizon, while the amount of light received when the sun is a definite distance below the horizon has a distinct economic value. Even the azimuth at which the sun will rise or set is not altogether a negligible quantity. Considerations of this kind have led Prof. Mohn to submit the question of twilight to a very close investigation, and to furnish tables which will enable an inhabitant of these northern regions to gauge very accurately how much direct or reflected sunlight he may expect. No doubt Prof. Mohn is well advised from a practical point of view, but in some respects his tables seem to aim at a greater

degree of accuracy than can be of service. In such questions as the effect of temperature on refraction, or the amount of reflected light, the variables arising from clouds and state of the sky generally would upset the nicety of the calculations. But so far as the convenience of the tables is concerned, and the thoroughness with which the theory is presented, there is nothing left to be desired, and it is not surprising if those who have not lived in a country where the economy of the winter light is a matter of importance fail to appreciate the necessity of this accuracy.

Prof. Mohn recognises four distinct steps in the approach of night or dawn. (1) The true time of geometrical sunrise or sunset when the sun's upper limb is on the astronomical horizon, or  $Z_1 = 90^\circ + r - \pi + \rho$ , where  $\rho$  is the refraction,  $r$  the sun's radius, and  $\pi$  the parallax. (2) The beginning and end of the gloaming (Skumringens Ende), when the sun's centre is  $4^\circ$  below the horizon. In clear weather in Norway, indoor work is possible under these conditions. Bright stars begin to appear in the sky. Sirius is visible when the sun is three degrees below the horizon. (3) It is more difficult to understand what is meant by the end of twilight. It is the time when daylight decreases most rapidly, and is described as the time when, in a clear sky, print can be read with difficulty if the light from the illuminated part of the sky is allowed to fall on the page, or when some kinds of outside work may be carried on. As a matter of computation, the time is decided by increasing the zenith distance of the sun, given in the first case by small angles depending on the atmospheric refraction, making the sun's zenith distance about  $98^\circ$ . (4) The last stage is that of complete night, or the time when the earth's atmosphere receives no light from the sun. The sun is then about  $17^\circ$  below the horizon. This scheme is a great practical advance on the method adopted in this country, where an arbitrary zenith distance of  $108^\circ$  is accepted as that at which night begins or ends. Tables are given for extending the calculations to other latitudes, and would make them available in the Shetland Isles and North Scotland.

*Maryland Weather Service.* Vol. ii. 1907. Pp. 515; illustrated. (Baltimore: The Johns Hopkins Press, 1907.)

THIS volume contains a report on the climate and weather of Baltimore and vicinity, prepared by Dr. O. L. Fassig under the direction of Prof. W. L. Moore, chief of the United States Weather Bureau; it is based on observations of the latter service since 1871, supplemented by all available records, both public and private, extending over a period of nearly a century. Meteorologists owe a debt of gratitude to the board of control of the Maryland Weather Service, and to Dr. Fassig especially, for one of the most complete and valuable meteorological discussions extant. Part i., which occupies more than half the volume, deals with climatic factors, each element being considered, so far as possible, with reference to its annual and diurnal periods and its variability; the statistical tables are supplemented by the usual range diagrams and also by isopleths, the principle of which was devised many years ago by M. Léon Lalanne. Although not frequently employed, the latter method exhibits in a concise and intelligent way the successive changes throughout the year. The value of this section of the work is much enhanced by careful discussion of the results obtained and of the interaction of the various elements, by references to the present state of our knowledge and to generally accepted theories.