

instead of uniting several as subgenera under one main genus, here again differing from English authorities. A good instance is afforded by a comparison of the species united under *Weisia* by Dixon with the same species that are referred by Roth to seven different genera; and two of these are quite separated from the others, as they fall under the *Cleistocarpi*. In his treatment of the *Hypnaceae*, to which family one naturally turns, Roth also differs considerably from Schimper. Dixon collects ten of Schimper's genera under his genus *Hypnum*, but specifies five of them as subgenera. Roth has twelve equivalent genera, but again four genera are placed in a different family, and unnecessarily, although not without reason, the genus or subgenus *Harpidium* is changed to *Drepanocladus*. This is one of the names which, it is hoped, will be sustained when the nomenclature of the cryptogams is discussed at the next International Botanical Congress.

The points of difference between this work and Dixon and Braithwaite's books are so numerous that British moss-workers will refer to the "*Europäischen Laubmoose*" for contrast rather than for comparison. As a practical handbook for naming mosses the work deserves much commendation, and bears ample evidence that the writer has definite opinions to express. It is a great pity that analytical tables for distinguishing genera are not given, but the descriptions are good, and important characters are thrown into bolder type. References to the most recent discoveries of new localities and new varieties will be found. The illustrations are very numerous, but poor in execution.

PHOTOGRAPHY IN SURVEYING OPERATIONS.

An Elementary Treatise on Phototopographic Methods and Instruments. By J. A. Flemer. Pp. xix+438. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1906.) Price 21s. net.

THE assistance that photography can render in the laborious work connected with topographical surveys has been repeatedly insisted upon, and the recognition of the fact is being displayed in the construction of a class of instruments admirably adapted for use in the field. With the more convenient instruments that experience will suggest, and with the shortened methods that familiarity will supply, the employment of photography is likely to be still more general, though doubtless it will have to contend against a certain amount of prejudice in favour of older methods.

Mr. Flemer's book is intended to overcome these prejudices and to determine the exact field which the camera can usefully occupy in surveying operations. The method has its limitations. The accuracy of a map constructed from panoramic views must evidently depend upon the precision with which objects can be identified and measured on a photograph or its enlargement. The use of telephoto-lenses or long-focused cameras would increase the accuracy, but at

the expense of convenience. More numerous photographs taken at shorter distances would also have the same effect, but then the labour of collecting and reducing the material would approach that due to the ordinary methods. It is the object of such a book as this to show that photography has distinct advantages peculiar to itself. But in many directions in which extreme accuracy is unnecessary, perspective views can be of essential service. A series of panoramic pictures showing the alteration in the face of the country due to volcanic eruptions, or the recurrent changes in sand dunes caused by winds blowing from certain directions at regular intervals, seem to be peculiarly suitable inquiries for photographic methods. Similarly, the changes in glacier formation and the determination of their motion, alterations in coast-line due to erosion, or the location of rocks and buoys would suggest other applications for the process. In wars and manœuvres, either with or without the use of balloons, the process has a large field of application.

Since the translation of a perspective view or combination of views into maps possessing considerable accuracy of detail is likely to concern many other professions than that of a surveyor, properly so called, it is most desirable to have a treatise in which is set out clearly the methods of construction and of the principles underlying the practice of the process. This want Mr. Flemer's book is intended to supply. That the author is competent to deal with the subject practically we entertain no doubt, but whether he has been successful in conveying his knowledge to others it is very difficult to judge. Surveying is technical work that can hardly be learnt without actual experiment in the field under the eye of a trained teacher. What amount of preliminary information is a pupil supposed to have before tackling the problems the author introduces? Certainly one ought to be accustomed to the use of the plane table and the time-honoured methods of procedure before addressing himself to the study of perspective views. The method should be regarded, not as a substitute, but as an addition, to the recognised processes.

Mr. Flemer's book consists practically of three parts. After a short preliminary historic review to show how the principles have been welcomed in various countries, the author discusses the phototopographic methods that various authorities have recommended. The fact that we have so many varieties of detail shows that the subject has not yet taken that mechanical, stereotyped form which it may be expected to assume when fully developed. The second part opens with a chapter on lenses, which seems hardly necessary to introduce the description of the many photogrammetric instruments now in use. This latter is a really valuable and excellent section. Finally, we have the details of the photographic operations, including the development of the plates and prints. There is not much that is new that can be said here, and the treatment of pinhole photography which is naturally connected with this subject is unfortunately discussed in another place.

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