

rewritten, and some of the inadequate practical details have been amplified. The chapter on the ultramicroscope stands out, as before, as one of the best in the book, and the later apparatus of Zsigmondy is here described. Moreover, the book is clearly printed in good-sized type, and the illustrations, although only the reproductions of line drawings, are unusually good for this class of figure.

A. E. H. T.

- (1) *Photo-Engraving Primer: Concise Instructions for Apprentice Engravers or for those seeking simple yet practical knowledge of Line and Half-Tone Engraving.* By S. H. Horgan. Pp. xvi+100. (London: P. Lund, Humphries and Co., Ltd., 1921.) 5s. net.
- (2) *Byepaths of Colour Photography.* By O. Reg. Edited and with an Introduction by William Gamble. Pp. xii+116+xiii-xx. (London: P. Lund, Humphries and Co., Ltd., 1921.) 5s. net.

BOTH these volumes are by "practical men," and they are characterised to the full, if we may say so, by the advantages and the disadvantages that might be expected to result from this fact. Each has a critical and, to a certain extent, supplementary introduction by Mr. W. Gamble, so that the reader may feel fully assured that he is in safe hands. (1) Mr. Horgan goes clearly and concisely over the subject as he has practised it, and as he is a man of great and prolonged experience, his instructions cannot fail to be of value to the student, whether or not he has arrived at the stage of workman. But it is not a treatise on the subject. The author leaves theory quite on one side, though here and there he justifies his directions by a shrewd statement of the trouble likely to follow variations of them. Perhaps the chief matter to notice is that Mr. Horgan uses collodion, while in this country gelatine plates have largely replaced it.

(2) Mr. Reg clearly describes his own system in which he uses a one-exposure camera, with one reflector and one compensator, and plates specially sensitised. He gives full details as to the making of the camera, formulæ for sensitising the plates, and instructions for the general procedure. Rather more than half the volume is devoted to throwing what he calls "side-lights" on certain notions of previous inventors. Here he is not always lucid, and his excursions into theory are not always fortunate. But he has been a diligent searcher with regard to the methods of other workers in this field, and gives many useful dates and references to patents, with illustrations of apparatus. He calls his volume "byepaths," and in this sense it is both useful and interesting. C. J.

*Forestry for Woodmen.* By C. O. Hanson. Second edition. Pp. 238+13 plates. (Oxford: At the Clarendon Press, 1921.) 6s. 6d. net.

DURING the ten years that have elapsed since the first edition of this book was published, much progress in the art of forestry has been made in this country. The necessity of having within our shores an ample store of growing timber to meet the possible emergency of war, is now admitted by statesmen. The Forestry Commission established in 1919 has been busily engaged in acquiring land for new plantations and in re-afforesting the extensive areas which were denuded

of timber during the war. Municipalities are awakening to the useful work of covering their water-catchment areas with trees, as evidenced by the new scheme of the Glasgow Corporation, which, if carried out, will create around Loch Katrine a magnificent forest, such as that owned by Liverpool at Vyrnwy in Wales.

The interest in forestry is increasing, and there is a demand for elementary instruction on the subject. This has been met by the publication of the second edition of this useful manual. It is well adapted for the purpose, being cheap in price, handy in form, and simple in language. Scarcely any change has been made in the original text, but two chapters have been added. One deals with the Forestry Act of 1919 and the Forestry Commission, and gives a summary of recent developments. The other new chapter treats briefly the afforestation of waste land, and gives a sketch of the survey necessary before any planting scheme can be decided upon. The book is brought up to date by the intercalation of a new paragraph here and there, and it may be recommended to land-owners, as well as to agricultural students and forestry apprentices, as a satisfactory guide to elementary forestry. The index is, however, incomplete, and should be enlarged to double its present size in a new edition.

*Problemi di Filosofia Botanica.* By Antonino Borzi. Pp. 344. (Roma: G. Bardi, 1920.) 60 lire.

THE introduction of this posthumous work contains a short historical sketch of vegetable biology, as foreshadowed by the elder Agardh, Delpino (to whose memory the book is dedicated), Haeckel, and others. The scope of the book itself is best indicated by the chapter headings: I. General conceptions and limits of vegetable ecology; II. Ecological principle of vegetable organisation; III. Ecological principles of vegetable associations; IV. Ecology of dissemination; V. Aerophylactic function in the vegetable kingdom; VI. Hydrophylactic function in the vegetable kingdom; VII. Form and evolution of the earliest vegetable life. VIII. Ecological conception of the evolution of the vegetable kingdom.

The author, a specialist on Cyanophyceæ, sums up very ably in chap. vii. his observations on the evolution of that group, and describes their extraordinary adaptability to varying ecological conditions. Continuous vegetative reproduction means a progressive development, from which no return to an earlier stage ever occurs; but development of the sexual function arrests such indefinite evolution and lays the foundation of constant characters. "Mutation" occurs before the development of sex. The polyphyletic origin exemplified in Cyanophyceæ is also manifested in the scheme of the entire vegetable kingdom.

The view generally held, that subaqueous life represents the primitive condition of terrestrial vegetation is regarded as unproved. Hydrophytes and aerophytes are probably two distinct stocks, the former representing primitive vegetation, the latter originating as Vascular Cryptogams at the period of land-emergence. That Bryophytes may possibly be survivals of a transitional stage between Hydrophytes and Aerophytes is not sufficiently clear. These views are set forth in detail.