

OUR BOOK SHELF.

The Flora of Perthshire. By F. Buchanan White, M.D. Edited by James W. H. Trail, A.M. Pp. lxi + 407; with a portrait of the author, and a map of the county. (Edinburgh: W. Blackwood and Sons, 1898.)

IT had long been known that the late Dr. Buchanan White was preparing a "Flora of Perthshire," when his death in 1894 arrested the progress of the work. The manuscript was then put into the hands of Prof. J. W. H. Trail, who has edited it.

The book is well arranged; clear, perhaps at the expense of detail of secondary value. For such we must consider the long strings of exact localities, common in such works, in this one usually summed up into short general statements. There is no doubt that the book has been carefully planned, that its aims are broad, and that all matter not of real concern has been excluded. Here and there we find critical remarks, or statements of the variability of the species. These are interesting; but the great feature of the book is in the new data relating to the altitudes reached by plants. It will be noticed that the upper limits of species usually are in excess of those given more than half a century ago by H. C. Watson for the Eastern Grampians; also that they differ in different parts of the county. So many of the glens of Perthshire run east and west, and gather from this cause heat in a way which glens open to north winds do not. Perhaps this accounts for the difference. The subject is one yet wanting many observations.

The manuscript appears to have been less complete when it changed hands than was thought. As a result we see a slight want of uniformity. One, who, like Dr. Buchanan White, united into a single species *Viola tricolor* and *arvensis*, would not be likely to follow the division of the genus *Hieracium* to the extreme. It is, indeed, a cause for regret that the author left no outline of the introduction, which he could so well have written. The essay reprinted in its place only deals with one question; and for others, which would have found a place, we must seek in his published papers. A list of these papers is incorporated in the book with a memoir of the author. I. H. B.

Manual Training: Woodwork. A Handbook for Teachers. By George Ricks, B.Sc. Lond. Pp. 187. (London: Macmillan and Co., 1898.)

WORKING in wood with carpenter's tools is now provided for in the curriculum of many public elementary schools, as well as in technical schools, with the object of training the manual and visual faculties to act in connection with the mental. Used with care, this manual work becomes a valuable educational agent, but unless it is carried out on an orderly system it degenerates into mere tinkering. Mr. Ricks has kept the true aims of manual training well in mind in the preparation of his work. "Our aims," he says, "must be wholly educational. We must arouse interest and quicken intelligence. We must develop and strengthen habits of attention, industry, and perseverance. We must train the eye to accurate observation, and the hand to dexterity in execution." The aspirations are commendable, and the author's experience has enabled him to develop a practicable scheme of work in which it is shown how they can be carried into effect. Beginning with a chapter on drawing as a factor in manual training in wood, this is shown to be the fundamental basis of the work. The necessity of exact measurement in all work, and the use of working drawings, is insisted upon; and rightly, for without drawings to scale, exact and intelligent handiwork is scarcely possible. An instructive chapter is given on the various woods used as timber, their structure, growth, preparation and properties. We notice that in explaining specific gravity with reference to

timber, Mr. Ricks adopts as his standard the weight of a gallon of water (10 lbs.), the specific gravity of oak thus being 8, of beech 7, and so on. This is convenient for some reasons, but it is apt to create confusion; and if the child afterwards learns that the specific gravity of iron is 7, he will wonder whether the metal or the wood is the heavier.

After the preliminary chapters and exercises come systematic work on the use of carpenters' cutting tools, simple workshop operations, and bench work from working drawings. The book shows evidence of thought and experience, and should prove of service to teachers of manual training.

A Description of Minerals of Commercial Value. By D. M. Barringer, A.M., LL.B. Pp. 168. (New York: John Wiley and Sons. London: Chapman and Hall, Ltd., 1897.)

A SET of tables for the identification of minerals is very useful to mineralogists and others; and as this note-book contains such tables and little else, it is welcome. The information is conveniently arranged so that it can be quickly referred to, nevertheless there are so many omissions that the book cannot be used to the exclusion of other books on mineralogy, and consequently its chief claim to consideration, that of saving time, falls to the ground. For example, under the heading of lead ores, only galena and cerussite are mentioned, although six compounds of bismuth and five of antimony are described. It may be hoped that Mr. Barringer will see his way to making his book more complete in future editions.

Ludwig Otto Hesse's Gesammelte Werke, herausgegeben von der Mathematisch-Physikalischen Classe der Königlich Bayerischen Akademie der Wissenschaften. (München, 1897.)

COLLECTED into one large quarto volume of over 700 pages, ranging in date from 1838 to 1874, we find here the mathematical articles in which Hesse laid the foundations of the modern analytical theory of Solid Geometry, with the details of which we are familiar in the treatise of Dr. Salmon.

The subjects discussed are all of geometrical interest, even where the title may indicate an algebraical flavour, as the analytical developments are such as arise from the investigations of geometrical properties. We may instance the researches on the Functional Determinant, called after the inventor the Hessian, which has played so important a part in the hands of Sylvester and Cayley. A biography, based on a memorial lecture by Prof. G. Bauer, completes the volume; in it a characteristic remark of Sylvester is embodied. It is interesting to learn that Jacobi utilised Hesse as a collaborator in developing the theory of the Attraction of Ellipsoids.

G.

Krömsköp Colour Photography. By Frederic Ives. Pp. xvi + 80. (The Photochromoscope Syndicate, Ltd., 1898.)

MOST of our readers have either seen or heard of Mr. Ives' process of colour photography, known now under the name of the Krömsköp System. In the small book we have before us, Mr. Ives gives the reader a concise account of the principles involved in this method of producing coloured pictures, describing and explaining at the same time the construction and action of the various krömsköpes which are now being manufactured. This information will be found very serviceable to any one who wishes to attain the maximum of efficiency in this branch of photography. In addition to the above instructions, reference is made to the literature on the subject, and various extracts relating to the nature, theory, &c., of colour from writings of well-known men are inserted.