

graphing the family Scrophulariaceæ in De Cardolle's *Prodromus* (1846), grouped these species with a few others as a subdivision *Pentasepalæ* of the section *Chamædrys*, characterised and distinguished from other subdivisions, and the majority of the species of the genus, by the five-toothed calyx as contrasted with the usual four-toothed organ. The disappearance, by gradual reduction, of the median sepal is one of the factors in the diminution of the zygomorphy, which is a feature of the *Veronica* flower when compared with the more strikingly zygomorphic forms typical of the family. These pentasepalous forms are to be regarded as an older type from which the more numerous tetrasepalous have been derived, and Dr. Watzl again directs attention to the fact that the character is a variable one, four-sepalled flowers being of frequent occurrence.

None of the three species which are the subject of the memoir occurs in the British Isles, but they are widely distributed in central and southern Europe. *Veronica prostrata* is the most constant of the three; besides the type only one form and one variety (from Siberia) are recognised. There is, however, a considerable amount of variation in habit, degree of hairiness, and size of parts; and, as shown by plate v., the leaf displays great variety in size and form in specimens from different localities. The other two species are remarkably polymorphic, and are subdivided by the writer into a series of subspecies, varieties, and forms, with, in several cases, a number of transitional forms between the different subspecies. Dr. Watzl has made a careful and exhaustive study of a large series of specimens from central and southern Europe, as well as of the citations in the numerous European floras, and the results of his work will have a special interest for the critical student of the European flora. It is inevitable, however, that the personal element should enter into such a detailed study of a highly variable species occurring over a somewhat extended area, and it is probable that other critical students of the same group would not entirely concur with the limitations of forms and varieties which are adopted by Dr. Watzl. A. B. R.

SCHOOL DRAWING.

- (1) *A Course of Drawing for the Standards. Being a Selection of Sheets from "A Complete Course of Free-Arm and Industrial Drawing."* By J. W. T. Vinall. Pp. 24+xxiv charts. (London: Blackie and Son, Ltd., 1910.) Price 6s. net.
- (2) *Natural and Common Objects in Primary Drawing, with Full Directions as to Their Use. A Handbook for Teachers.* By J. W. T. Vinall. Pp. v+68. (London: Blackie and Son, Ltd., 1910.) Price 3s. 6d. net.

(1) THE issue of the author's "Complete Course of Free-Arm and Industrial Drawing," in sections is a wise step that will be much appreciated by teachers. The first portion, published as "A Course of Kindergarten Drawing, for Infants and Small Children," has now been followed by a second and more advanced selection under the title given above. It

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outlines a progressive school course for youths from six years upwards, corresponding to standards I. to VII. and beyond. The first six plates deal with brush work and the principles of colour harmony, with applications to natural objects and ornamental designs. The next six illustrate a well-graded course of free-arm drawing in coloured chalks, based on circular, elliptic, and compound curves. The applications to natural and familiar objects, to ornamental patterns and designs, with reference to the laws of growth, repetition, and radiation, are very numerous and intensely interesting. The remaining charts comprise free-hand drawing in pencil, crayon, and with the pen; further brush work and shading; and model and perspective drawing, with technical and other applications. The plates are accompanied by a very lucid and suggestive description that will prove most valuable to teachers. They are beautifully executed, generally in colours. As a whole, the work forms as admirable a course of school drawing as could be desired, and impresses the reader with the great educational value of training conducted on lines indicated by the author.

(2) This is a new work, intended to be supplementary to the one noticed above, its main object being to assist the teacher in the selection of objects, properly graded and suitable for class instruction in drawing in elementary schools. It is based on the syllabuses of the English and Scottish Boards of Education. The objects are displayed in a number of plates, to which teachers will often be glad to refer. The illustrations include familiar objects in common use, nature forms and specimens, subjects for measured drawings, and specimens of alphabets and printing. The plates are described in the text, and are preceded by a general discussion of the aims and qualifications of the teacher, of the apparatus used, and of the methods of work. The book can be recommended to teachers as affording valuable guidance in their work.

OUR BOOK SHELF.

Iron and Steel Analysis. Vol. i., Ordinary Constituents. By A. Champion. Pp. 80. (Glasgow: Fraser, Asher and Co., Ltd. 1910.)

THIS small handbook gives a detailed account of the methods used in determining the six or seven elements invariably occurring in pig-irons and ordinary steels, and also those employed in the proximate analysis of coal.

With few exceptions, one method only is described for each element, and in every case one which has been in use (with modifications) in steel-works' laboratories for many years. Although, therefore, there is nothing new by way of contribution to the existing literature on the subject, the book is eminently suited to beginners. It is doubtful, however, whether the author's hope that works chemists will find the book useful will be realised, as some of the methods described are by no means quick enough. Rapidity, consistent with accuracy, is a very important consideration in steel-works laboratories, a fact which the author obviously recognises in the preface.

The opening out of grey irons with hydrochloric acid in silicon determinations, as described in this