the Microdrili the Lumbriculidæ, Tubificidæ and Naidomorpha are united into the superfamily Lumbriculides; the Perichætidæ, Cryptodrilidæ and Acanthodrilidæ constitute the superfamily Megascolicidæ among the Megadrili. The three groups include about 125 genera and 650 species, divided between thirteen families. Vejdovsky's family of the Chætogastridæ is abandoned, the genus Chætogaster being placed in the Naidomorpha, and no mention is made of the doubtful family of Discodrilidæ of the same author, with its single representative, the leech-like parasitic Branchiobdella, while the Criodrilidæ of Vejdovsky are absorbed by the Geoscolicidæ.

It is to be deplored that numerous inaccuracies occur. Many of these, no doubt, are due to careless proof-reading, but some are of a graver sort, and of a kind to shake the readers confidence in the entire trustworthiness of the work. On page 110 we read that "there are as a rule but a single pair of glands [spermiducal glands] in the Megascolicidæ; but exceptions are known; thus with the exception of *Acanthrodrilus monocystis* the Acanthodrillidæ have always two pairs opening onto the seventeenth and eighteenth segments," but Fig. 45 shows that in five species of Acanthodrilus the spermiducal gland pores lie in segments XVII and XIX; further in the definition of the genus Diplocardia (also an Acanthodrilid) we read page 548 'spermiducal gland pores on XVIII, XX.' Again in the definition of the genus Diplocardia we see 'setæ paired, absent from segment XIX on which lie the male pores,' and turning to the definition of Diplocardia communis we find 'male pores on XVIII, XX.' This is worse than confusing. Occasional inaccuracies as to authorities also occur; for example on page 314, where the genus Distichopus is accredited to Verrill instead of to Leidy.

Great praise is due to the author for the exhaustive bibliography he has collected, however we feel compelled to censure him for the way in which it is put together, and we claim a certain right to do this since he tells us, at the beginning of his bibliography, that 'with a few exceptions (marked with an asterisk) every quotation has been verified by myself.' To begin with, we consider dates in bibliographical references to be of very great importance, but we find that only a very small percentage of the titles of the great list here given bear any date at all, and many of these are wrong. In addition to the omission of dates there are inaccurate details, the effect of which is to send one astray. One is not much aided by a reference without a date, to Vol. II., which should read Vol. XIX., as in Bergh (3); such references are unfortunately many. Again under Rosa (28) we are referred to 'ibid,' i. e., Ann. Mus. Civ. Genova, X., whereas the paper referred to appeared in Boll. Mus. Zool. Torino. II. T. Reichard appears for J. Reighard, and Lumbriculidæ for Lumbricidæ. Such slips are not confined to the bibliographical list; for example on page 711 we are referred to Rosa, Boll. Mus. Zool. Torino [no volume] 1872, when it should be twenty years later, in 1892. These examples are taken at random. There is no list of corrigenda. There is an index to genera and species only, and one is dependent upon a brief table of contents for other references. The imprint of the Clarendon Press is sufficient warrant for the typography and press work, which is of the highest order.

In conclusion, we would say that Mr. Beddard has undertaken a great task and has done it fairly well; he deserves the thanks of all students of the Oligochaets. A general synoptic key or table would have been a welcome addition for the student in the determination of species, while a careful revision of the manuscript would have made the book much more satisfactory. As it is, Mr. Beddard has given us an extremely valuable contribution to this branch of the Annelida.

W. McM. WOODWORTH.
FRANK SMITH.

A Manual of Qualitative Chemical Analysis, by E. P. HARRIS, PH. D., LL D., Professor of Chemistry in Amherst College. New Edition thoroughly Revised and Corrected. Amherst, Mass. 1895. 315 pages.

In most colleges the course in chemistry begins with lectures or recitations on the non-metals, generally combined with laboratory work, and this is followed by laboratory work in qualitative analysis. A question may be raised as to whether qualitative analysis is

the best medium through which to gain a knowledge of general chemistry either of the metals or the non-metals; indeed it is probable that the importance of qualitative analysis has been much over-estimated. It is of course necessary for those who intend to make a thorough study of the science, but the majority of college students do not pursue chemistry more than a single year, and it should not be difficult to devise a year's course in chemistry in which the student would gain far more knowledge of chemistry and more intellectual development than in the ordinary course, where such a large portion of the time is spent on qualitative analysis. There are dozens of laboratory manuals before us, in many, not to say most, of which the author's effort has apparently been to boil the matter down to the least possible space; the result has been the production of a series of more or less extended tables which the student follows blindly in searching for the contents of his unknown solutions, knowing nothing of the reasons for any step and gaining no knowledge of chemistry. Indeed, one may become a good analyst and know little of chemistry.

There are however teachers who use qualitative analysis as merely a medium of instruction in chemistry; who subordinate the acquisition of analytical skill to the acquisition of a knowledge of general chemistry and chemical theory. Such an one is the author of this book, and the present edition of his manual is the fruit of over three decades of laboratory teaching. The result is not a manual for self-instruction, but rather a guide to be used under the immediate supervision and instruction of a competent teacher.

The first half of the book is devoted to the reactions of the more common bases and acids, the students working with known solutions of a single salt and writing out each reaction on the blank pages with which this part of the book is interleaved. In this manner the student becomes familiar with these reactions, which represent all the ordinary ones used in qualitative and quantitative analysis. As he progresses in this work he is supposed to be furnished with solutions of unknown single salts for determination. This part is also intended to be supplemented by a course of lectures on the metals and their compounds. The second part of the book is devoted to the systematic examination of solids. The method used here is that which was first introduced by the author and is now with greater or lesser modifications generally in use. It is safe to say, however, that little improvement has been made upon the original.

This is followed by qualitative separations. Here, while alternate methods are now and then given, the methods are generally confined to that one in each case which has proved itself best in the author's experience. There is a decided advantage in thus limiting the possible modes of procedure, as freedom of choice is confusing to the novice. Indispensable as Fresenius is to the advanced student, it is almost useless to the inexperienced.

A supplement gives fully the reactions of nearly all the rare elements, while a chapter in the appendix on the preparation of reagents will be useful to teachers. The earlier editions of the book have proved its success in the hands of no inconsiderable number of teachers beside the author, and this revised edition, which is a very considerable improvement on those which have preceeded it, will be found even more valuable. If chemistry is to continue to be taught as largely through qualitative analysis as it has been in the past, this manual may safely be recommended as the best of its class. It is the writer's hope, however, that the day is not far distant when the improvement will be not along the old lines, but in the methods of chemical teaching themselves. The general style and make-up of the the book is good, but it is unfortunately marred by poor proof-reading.

Jas. Lewis Howe.

Washington and Lee University,
Lexington, Va., October 19, 1895.

La sensibilité de l'œil aux couleurs spectrales. M. H. Parinaud. *Revue Scientifique*, Sér. 4, T. 4, 134—141. August 3, 1895.

In the *Revue Scientifique* for June 8, Parinaud described an interesting series of experiments on the relative sensibility of the adapted and unadapted eye to spectral colors.* In the issue of the same journal for August 3 he gives his

*See review in Science, II., 418, Sept. 27, 1895.