

hints in the concluding chapter should be found very serviceable.

Mr. Brothers has produced a very serviceable and useful addition to our photographic literature; as a handbook for students it perhaps is somewhat too bulky, but nevertheless it will be very much used by them. Every photographer who wishes to know something about the art with which he is working, and who does not wish to limit himself to the mere cut-and-dried manipulations, should at any rate make himself acquainted with the volume.

W. J. L.

MATRICULATION CHEMISTRY.

Matriculation Chemistry. By Temple Orme. (London: Lawrence and Bullen, 1892.)

THIS is still another elementary manual dealing with the non-metals and their compounds. According to the author it can be studied most advantageously if the rudiments of chemistry have first been acquired. The book is built on pretty much the same plan as many already in existence; here and there, however, the reading is enlivened by ideas which, if not altogether commendable, have some pretensions to novelty.

The author is evidently of opinion that much of the ordinary chemical knowledge can be presented in other ways. Mass and weight first receive attention. In this book there are no atomic weights; atomic masses reign supreme. In using a balance we are told that we do not find weights, but "only masses." Indeed to bring this idea home the following curious question is set:—"When you 'weigh' a thing in an ordinary balance, do you find its weight?"

After a passing allusion to constitutional formulæ, in which they are likened to pyrotechnic frames, the next important alteration with which the author concerns himself refers to the nomenclature of oxides. Such a name as sulphur dioxide or carbon dioxide is discarded, for it is "founded upon a formula which is liable at any time to be altered so as to suit our knowledge of atoms and molecules." Anhydride is described as, "etymologically at least, a still more atrocious term"; hence we find that throughout the book SO_2 , CO_2 , &c., are spoken of as acids. P_2O_5 is said to be a tribasic acid, N_2O_5 a monobasic acid. CS_2 is called sulphocarbonic acid, P_2S_5 thiophosphoric acid, N_2O hyponitrous acid, and so forth, in spite of the fact that such compounds as that formed from "hydric oxide and phosphoric acid (*sic*) are often called acids by modern chemists."

The definition of a salt is thus summarily disposed of:—"You are often asked what a salt is; the only possible answer is that it is a compound."

Such methods of tampering with terms which have a generally-accepted meaning should, it seems to us, meet with no encouragement. They can only end in muddling the reader who wishes to pursue his subject by the aid of any of our standard works. But matter which is liable to do more immediate harm is frequently to be noted. For instance, it is stated that there is no such thing as the Law of Multiple proportions—it is only a corollary of

the atomic theory. If, according to its usual interpretation, a law is a generalized statement of fact, it is rather hard to see how its existence is affected by its relations to any theory.

To most chemists the brilliant work of Moissan has sufficed to settle the question of the isolation of fluorine; the author is, however, still sceptical on this point. P_2O_3 is given as the formula of phosphorous acid (*sic*); recent research has shown P_4O_6 to be correct. The valency of potassium is said to have been fixed by a "minute study of its gaseous compounds," water is stated to be elastic with regard to shape, and from Avogadro's hypothesis molecules of different gases are stated to be equal in size.

Even when the author is apparently trying to be precise he is apt to mislead. The following definition is an example:—"A chloride means a compound of chlorine with some other substance which, though it is not itself metallic in its general characteristics, possesses that important property of a metal, the capability of uniting energetically with chlorine." Is it to be understood from all this that a chlorine compound which is not produced by energetic union—say an endothermic compound like C_2Cl_4 —is not a chloride?

These extracts may serve to show that the book requires to be carefully overhauled before it can be placed with confidence in the hands of a beginner.

OUR BOOK SHELF.

Vegetable Wasps and Plant Worms; a Popular History of Entomogenous Fungi, or Fungi parasitic upon Insects. By M. C. Cooke, M.A., LL.D., A.L.S. [364 pp. 4 pl. and figs. in text] (London: S.P.C.K., 1892.)

It is somewhat surprising that a book on a subject of such importance alike to the entomologist and fungologist has not been forthcoming long ago. It is true that a Memoir on the subject was undertaken thirty-five years ago by Mr. G. R. Gray, but, being privately printed, was limited in circulation. To this work Dr. Cooke admits his indebtedness for a large amount of information bearing on the entomological aspect of the subject, and it is to be regretted that he was not aware of the existence of a much extended manuscript revision of the same work, at present in the Botanical Department, Natural History Museum.

Dr. Cooke's book is professedly a popular work on the subject, and consequently does not deal with the economic side, relating to such matters as the "muscardine" or silkworm disease, further than to indicate the nature and affinities of the fungus causing the disease.

The fungi parasitic upon insects are arranged under four primary groups: the *Cordyceps* group, the *Laboulbeniaceæ*; the *Entomophthoræ*, and lastly a heterogeneous collection of moulds, which, with few exceptions, are not truly parasitic and destructive. The structure and general characteristics of these groups, with glimpses of their life-history, are dealt with in an introductory chapter. Entomologists, whose main interest will be to ascertain the name of any fungus parasitic on an insect, will find this a comparatively easy matter, as the general arrangement is an entomological one, commencing with the Hymenoptera; and under each is given an account of all the fungi that are known to be parasitic upon species included in the order. Numerous woodcuts in the text and four plates assist very materially in the determination of species. From the mycological standpoint the arrangement indicated above is purely artificial, and introduced