

the typical forms are thereby necessarily increased. In order to preserve the just proportions of the subject, and out of the whole make a fair selection, I have treated most of the forms in less detail than the Vertebrates." With the above statement no objection could be found; as to the method of carrying it out, we notice that while four out of the sixteen plates are devoted to illustrations of the group of Protozoa, there is not even a single figure given of the Sponges, nor of the Hydrozoa, nor of the Actinozoa, and for their absence we can find no other excuse than what is given in the above quotation. As to the plates of Protozoa, we perceive that there is no exact indication of the size of the forms figured, unless indeed in a footnote, which states that the forms figured "are all *microscopic*, with the exception of the Nummulites." Now if there is one thing more than another that a student requires to be reminded of while studying "microscopic" forms, it is that they vary immensely among themselves as to size, and it is surely necessary that he should have some definite ideas as to those sizes beyond the range of unassisted vision, such as he may be presumed to have of those objects within this range. Neither has the author been to our mind happy in his selection of forms of the Protozoa "from standard works on the subject." His Atlas is meant for students in this country, and where are they to get specimens to work with of such genera as Protogenes, Vampyrella, Myxastrum, Protomonas, Protomyxa, Lieberkühnia, and the like. The student interested in "pond-life" may possibly admire the exquisite and artistic delineations of their old favourites, *Paramacium*, *Daphnia*, *Cyclops*, &c., given in the Atlas. The festooned surface of *Paramacium*, the appendages of *Daphnia* and *Cyclops* are certainly figured as they have never been heretofore. It is really refreshing to turn from the old and well-worn figures to the bold originality of these plates; in them the author has courageously followed the theory of zoological representation laid down by the celebrated German artist with reference to *Camelus*, sp., but is scarcely to be congratulated on the wonderful results he has achieved. Some of the diagrams are acknowledged as from the originals of Huxley and Gegenbaur; these are good.

The Student's Handbook of Chemistry. With Tables and Chemical Calculations. By H. Leicester Greville, F.I.C., F.C.S. (Edinburgh: E. and S. Livingstone, 1881.)

"In the presence of so many good manuals on chemistry, the appearance of another may seem unnecessary," says the author in his preface. For "may seem" read "is," and the sentence expresses a truism. The author's book can, however, scarcely be classed amongst "good manuals." The statements of individual chemical facts are on the whole correct; the general arrangement of the book is clear; yet, considered as a manual of chemistry, the work must be pronounced a failure.

Attempts are made to explain the expressions "atomic weight," "molecular weight," "valency," &c., but without success. Atoms are confused with molecules; the ordinary definitions of these terms are certainly stated, but definitions taken by themselves are, as Hunter said, "Of all things on the face of this earth the most cursed."

Avogadro's law is stated on p. 26, but the conclusion deduced therefrom, viz. "the densities of all the elementary bodies in the gaseous condition are the same as their respective atomic weights, or, the atoms of all the elements in the gaseous state occupy the same space," is untrue, and does not follow from the generalisation of Avogadro.

The Daltonian atomic theory is stated much in the terms which might have been employed before the molecular theory of matter had been propounded. Such statements as that on p. 15, that oxides are called monoxides, dioxides, &c., according "as the compounds contain one, two, three, &c., atoms of oxygen respectively"; or

that on p. 13, "that acids are spoken of as monobasic, &c., according as they contain one, two, &c., atoms of hydrogen replaceable by a base," show that the author has failed to grasp the teachings of the molecular theory.

The term "valency," we are told on p. 159, is used to express "the comparative saturating power of the different elements, taking hydrogen as the unit." Such a loose statement as this naturally prepares the way for the full acceptance of the "bond" view of valency, with all its inconsistencies and apparent, but unreal, explanations of facts; so that one need not be surprised to find (p. 160) the expression, hard to be understood by the uninitiated, "the affinity of these bonds."

A sentence on p. 161 may be quoted as a type of the kind of writing to be found in the works of those who are bound by the trammels of this pernicious system. "The disappearance of the active atomicity by twos, which is found to be always the case, has led Dr. Frankland to suggest that the bonds of union so disappearing are engaged in satisfying each other."

That part of the chapter on "The Higher Principles of Chemical Philosophy" which deals with compound radicles is equally unsatisfactory. Sulphuric acid may be assumed to contain the radicle SO_2 . "The group SO_2 may be traced all through the compounds of sulphuric acid, thus: $\text{SO}_2(\text{OK})_2$, $\text{SO}_2(\text{ONa})_2$, SO_2CuO_2 ." Such a statement is harmful, and only harmful, to the student; in what light other than as an amusing plaything can he regard this conception of compound radicle? Why should he not trace the group SO_3 , or the group SO , or the group SO_4 "all through the compounds of sulphuric acid"? Give him pen and paper, and if he have a little fancy he will trace you a most varied and pleasing number of groups "all through" as many compounds as you please.

The tabulation of facts concerning groups of elements and compounds is a good feature in this book, and likely to prove very useful to the student. The chapters dealing with organic chemistry are clear and succinct: had the author contented himself with recording leading facts, and left the "principles of chemical philosophy" alone, he would have produced a book of some merit, although not of merit sufficient to warrant him in adding another "Manual of Chemistry" to the list which is already so much too long.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.]

[The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

The "Eira" Arctic Expedition

THOSE who advocate the despatch of a Government vessel in search of Mr. B. Leigh Smith's expedition betray only a partial acquaintance with the circumstances of the case. His having failed to return this season is no evidence whatsoever of his having met with disaster; for previous to his departure from England, certain people well understood that he was prepared to spend the present winter far north if he found it worth while to do so. It was this which prevented me from going with him (natural history work on hand precluding my absence from London for upwards of a year); for as I had collected plants and animals with him on a former expedition in Spitzbergen, he invited me to accompany him on his present trip to Franz-Josef Land. The *Eira* was well-provisioned for upwards of eighteen months, and in summer time fresh meat in abundance can be secured, which, hung up in the rigging, will keep good for almost an indefinitely long period. Thus the expedition has provisions enough for at least another year and a half from the present time, and there would be no need for them to starve two years hence. It is therefore rather