NEW BOOK.

The Nature of Matter and Electricity: An Outline of Modern Views. By DANIEL F. COMSTOCK AND LEONARD T. TROLAND. New York: D. Van Nostrand Co. 1917. 203 pp. $2.00 net.

This book is an important addition to "popular" scientific literature, covering an extraordinarily wide range of scientific knowledge with great success.

The text is divided into two parts: the first is a brief outline of the modern theory of matter, electricity and energy, by Professor Comstock; the second and larger part, by Doctor Troland, is an appendix which discusses in fifty-six sections, with further detail, some of the problems touched upon in Part I.

In Part I, Professor Comstock's wide knowledge and charming clarity of expression are most successfully employed, and the text can be recommended without reservation to scientists and laymen alike. Part II is also a successful achievement and will provide the layman with much correct information and a happy insight into the spirit of modern physical thought. For the scientist, however, the second part of the book is marred by a number of statements which, to say the least, do not accord with the most plausible modern views.

Thus, on page 60, we are told that atoms and molecules both are probably pretty nearly spherical. Even if the author of a book published in 1917 were not familiar with the work of Langmuir on the shape of molecules, the commonest facts of organic chemistry should have made him cautious about writing a paragraph which will certainly give the layman the idea that all molecules are nearly spherical. And, furthermore, as to the shape of atoms themselves, the facts connected with the spatial properties of chemical valence, are certainly so important as to make it very undesirable to permit the reader to carry away the idea that the boundary of an atom is a homogeneous spherical shell.

On page 93, we are told that Maxwell may be considered as the founder of kinetic theory which is certainly a little hard on Clausius and others.

On page 95, the impression is certainly given that the kinetic energy of the molecules of *any* substance is proportional to the absolute temperature, which, is as a matter of fact, only true for dilute gases. The variations from the "principle of the equipartition of energy" are indeed so great that the molecules of a solid at low temperatures have practically no kinetic energy at all, although the molecules of a gas at the same temperature would have a large average kinetic energy.

On page 119, we are told that in general, the stronger the internal forces that hold the atoms of a compound together, the greater will be the specific heat, which is manifestly in general not true.

Other examples of a similar kind might be given. On the whole, however, the book must be considered as a distinct success.

RICHARD C. TOLMAN.

An Elementary Study of Chemistry. By WILLIAM MCPHERSON AND WILLIAM EDWARDS HENDERSON, 2nd revised edition, 576 pages, $1.60. Ginn and Company, 1917.

This is a revision of the first of the three well-known texts by the above authors. It is addressed to classes which have not had a preliminary course in the High School but are old enough to profit by a presentation more advanced than that usually given to college-preparatory students. The authors have attempted "to make the text clear in outline, simple in style and language, conservatively modern in point of view;" and in this they have been eminently successful.

"The question as to what shall be included in an elementary text on chemistry is perhaps the most perplexing one which an author must answer." To this all will agree, especially if to this perplexity be added that of the best arrangement of topics. Some authors have attempted to escape the first dilemma by including everything—an easy method by which the teachableness of the text suffers somewhat from its encyclopedic character. One can not see the trees for the forest. In this, newest of texts, one could wish for less rather than more, but the coördination is so good, the back-references so frequent, that a young student will hardly find himself at loss in the wealth of information.

It is pleasant to find a separate chapter on the fundamental topic "Acids, Bases and Salts; Neutralization;" also one on "Valence"—old fashioned valence!

In regard to sequence, nearly all texts present oxygen and hydrogen first of the elements; but after that there are nearly as many different orders of presentation as there are authors. In this volume, the elements appear thus:—carbon first, then nitrogen, chlorine, sodium, sulfur; then the families of the non-metals; then the metals in the usual order. These chapters are interspersed with others on the fundamental laws and theories of chemistry, so arranged that in each case the foundation for the theory there presented is found in illustrations immediately preceding. In this the text excels; also in the fact that the authors have not been tempted to lead the student too far into those branches of theory which, though suitable for the university student, may be and therefore should be deferred until adequate treatment may be given in, at least, a second-year course.

The size of the volume is more attractive than that of the "Course in General Chemistry" by the same authors. In general appearance the book is one of which the publishers may well be proud. It will doubtless find for itself a broad field of usefulness. ARTHUR JOHN HOPKINS.