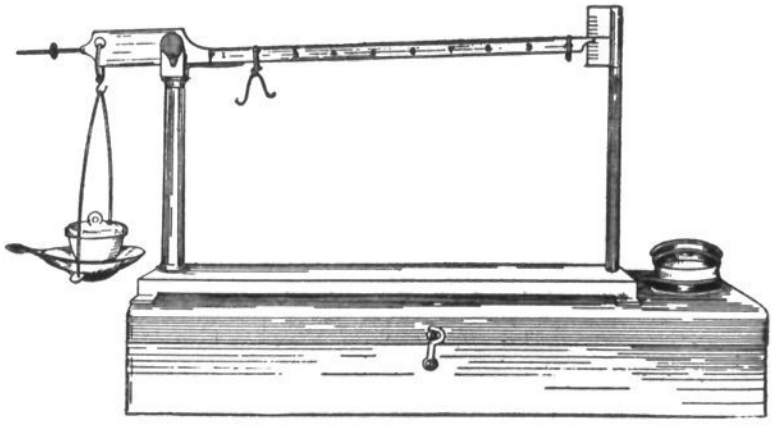
of my students in their first year's laboratory practice, and has served its purpose so well in two large classes that I venture to call attention to it in the hope that others may find in



it a satisfactory solution of the balance problem in their schemes of beginners' laboratory work.

It is simple, efficient, and not expensive. The posts and beam are of lacquered brass ; the base of iron. The length of the beam is twelve inches. The riders are of three weights, equivalent, when at the first division of the long arm, to 1.000, 0.100 and 0.010 gram respectively in the pan. Thus, in the cut, the weight of the crucible is 12.230 grams. The balance is sensitive to 0.010 with a load of 30.000 grams, and to 0.005 gram with a smaller load. Adjustment to zero before weighing is effected by means of a nut at the end of the short arm. It may be obtained of Messrs. Richards & Co., of New York.

JOHN TAPPAN STODDARD.

NEW BOOKS.

ANALYTICAL CHEMISTRY. BY N. MENSCHUTKIN, PROFESSOR IN THE UNIVERSITY OF ST. PETERSBURG. Translated from the Third German Edition, under the Supervision of the Author, by James Locke. London and New York : Macmillan & Co. 512 pp. Price $4.00.

Although the plan of treating the whole subject of analytical chemistry, qualitative and quantitative, in one volume has obvious merits, it is nevertheless something of a novelty, in this country at least, and on this and many other accounts this translation of Professor Menschutkin's work is very welcome.

It is not a book that can be used to the best advantage without good accompanying and supplementary instruction, and this is not because it is incomplete or unduly concise, but because the ideals and aims of the author are high ones, and the teacher is constantly needed to read between the lines. Principles are dealt with from the very first to the last and the *rationale* of the method is the point on which stress is laid. In the first part of the preface the author sets forth briefly his views as to the value of analytical work in a course of chemical study. His recommendation that it be not taken up too early is especially to be commended, as is also the plan of laying great stress upon the development of methods by the student himself, a practice altogether too uncommon.

The first 280 odd pages of the book deal with qualitative analysis. In its treatment of this difficult subject it differs markedly from the majority of treatises. There are no "tables" or "schemes." Each group of metals is first carefully studied with reference to its distinguishing group characteristics. Afterward the special properties and reactions of the individual members are taken up, and finally the analytical process deduced from the results. The plan of frequently giving solubilities quantitatively is a very helpful one. There are a few curious mistakes; for example, it is stated on p. 32 that potash alum is *less soluble* than the cesium and rubidium alums. The chromium bead is spoken of as *blue* instead of green (p. 70). This is evidently a slip of the pen, as the color is correctly given a few lines further on. Again on p. 126, in describing the analysis of columbite and tantalite, the mixture of oxides obtained by fusing the mineral with acid potassium sulphate and boiling out with water is said to be treated with ammonium sulph*ite*, instead of sulph*ide*. This, however, appears to be a misprint, as shown by the context. The word oxide is frequently used where hydroxide is meant.

The remaining 230 pages are devoted to quantitative analysis. This part of the book is treated in three sections. I. Gravimetric Analysis. II. Volumetric Analysis. III. Organic Analysis. In the first section the metals and metalloids are dealt with according to the following general plan: First the methods

are given for determining each individual of the group, then the methods for separating the different members of the group from each other. This is a better plan than the more common one of giving all the determinations first and afterwards all the separations.

The descriptions and directions are decidedly concise, but sufficient for the needs of fairly advanced students. Beginners will need and should in any case have considerable supplementary instruction. The non metals are treated according to the same general plan. A chapter of "operations and examples" follows, which might perhaps have been put with more profit at the beginning instead of at the end of the section.

Volumetric analysis is taken up according to the same plan as pervades the whole work. One very commendable thing about this and other parts of the book is that the student is not bewildered by a multitude of methods, but is simply made acquainted with such as have earned their right to existence. The section devoted to organic analysis is valuable and complete.

The translation is fully up to the average of such work. It reads for the most part smoothly and at least does not require retranslation into English, which is more than can be said of some recent efforts in this line. JOSEPH TORREY, JR.

ON THE DENSITIES OF OXYGEN AND HYDROGEN, AND ON THE RATIO OF THEIR ATOMIC WEIGHTS. BY EDWARD W. MORLEY. 1895: Smithsonian Contributions to Knowledge. 4°. Forty cuts. xii., 117 pp. Price, $1.00.

The ratio between oxygen and hydrogen is, to speak figuratively, the base-line upon which our entire system of atomic weights depends. But few of the other elements can be readily compared with hydrogen directly; practically all of them are referred to hydrogen through the intervention of oxygen; and so the atomic weight of the latter needs to be known with the utmost accuracy. A small error here becomes cumulative when introduced into the computation of higher values, and in the case of uranium it is multiplied to fifteen times its original magnitude.

Ten years ago the atomic weight of oxygen seemed to be pretty well known, and stood very nearly at 15.96. This, how-