introduction of copious footnotes which deal with sources, historical information, difficult demonstrations, interesting generalizations, and conceptions too advanced for the text proper. Thus, the discussion of the theory of assemblages is supplemented in the footnotes by reference to transfinite assemblages; and the ordinary presentation of the integral is supplemented by the introduction of upper and lower integrals.

The comprehensive, suggestive, critical footnotes greatly enhance the value of the work.

The volumes under review are especially valuable for those who wish a thorough treatment of the fundamental conceptions, and an introduction to the latest ideas, for the author has not only given a sketch of these phases of the subject, but has also indicated many sources.

GEO. N. BAUER.

Lectures de Mécanique: La mécanique enseignée par les Auteurs originaux. Par E. JOUGUET. Deuxième partie: *L'Organisation de la Mécanique.* Paris, Gauthier-Villars, 1909. 284 pp.

MANY of the mathematicians who teach the elements of mechanics may have more or less serious *arrières pensées* relative to the way in which they have presented the fundamental concepts to their students, and they may form many a good resolution as to the severe logical thinking they will expend upon the subject to the end that the next time they teach it the presentation may gain much in completeness and consistency. To all such Jouguet's Lectures are a godsend,—not that all the difficulties of the doubting ones will be relieved by the perusal of the work, but that the doubts and perplexities of the great creators of mechanics, and the way they settled them or at least thrust them aside, are here detailed. For the plan of the work, as the subtitle indicates, is to teach (the foundations of) mechanics by (large extracts from) the original authors. We may say that Jouguet selects his quotations well and makes each one sufficiently long to be intelligible of itself; but one must add that his own careful critical comments are very helpful toward the fullest interpretation both of the material cited and of the subject itself.

The work consists of three parts: the first, which is not at hand, called La naissance de la mécanique; the second, which is under review, entitled L'organisation de la mécanique; the

third, which as yet is only projected, to be designated Les bornes de la mécanique. Although the first and last parts must of necessity throw much light upon the second, it should be observed that this second, which has chiefly to do with the dynamics of a particle and rigid body and which as such bears most closely on the problems of interest to the teacher, may without difficulty be read alone. And the reading is highly to be recommended. The extremely logical may long for a specific set of postulates by virtue of which the subject matter and terms of elementary mechanics shall be defined; but though the actual establishment of such a set be a worthy scientific objective point, one should recognize that it may have much of the sterility of any puristic accomplishment,—the instructive thing is to contemplate the foundations of a subject from various angles, and this is precisely what Jouguet makes easy for us in reference to mechanics.

We have written from the point of view of the teacher, but the student, the physicist, the philosopher will find much of interest to them in these pages, and the logician who would construct a set of postulates for mechanics which should be of real value to teacher and pupil as well as of scientific exactness cannot safely neglect the points of approach which the race, through its geniuses, has shown to be the genius of the race.

E. B. WILSON.

CORRECTION.

PROFESSOR D. R. Curtiss calls our attention to the following erratum in his paper published in the BULLETIN in June last:

Page 466. In the formula for the determinant $\Delta_n(x, \xi)$, the index $n-2$ should, throughout the last row, be replaced by $n-3$.