Some of the topics in Professor Hobson's very interesting 27-page chapter are: mathematics and practical life; evolution of mathematical concepts; physics and mathematics; dynamical theory of tides; mathematics and physical science; optics and mathematics; abstract dynamics; geometry; reform of teaching; the teaching of mechanics; university teaching; research.

The volume as a whole is exceedingly readable and the reviewer considers that a perusal of its pages must convince any one that pure science is *not* to be regarded "as something apart." R. C. ARCHIBALD.

*Cours de Mécanique.* Vol. II. By LÉON LECORNU. Paris, Gauthier-Villars, 1915. 538 pp.

THIS is the second of the three volumes of a treatise on mechanics for use in l'Ecole Polytechnique. The first volume was reviewed in the BULLETIN for April, 1915. The present volume is devoted to theoretical mechanics with a few immediate applications and it is the intention of the author to treat the mechanics of engineering in the third volume.

The first four parts of the complete course are contained in the first volume. The second volume begins with the fifth part, on general dynamics, which includes the fundamental theorems on the motion of a system of particles, the theory of energy, constrained motion, impact, the equations of Lagrange, and small oscillations.

The dynamics of a rigid body is the subject of the sixth part and includes the following topics: moments of inertia, rotation about a fixed axis, motion parallel to a fixed plane, motion about a fixed point, motion of a heavy homogeneous solid of revolution on a smooth horizontal plane, motion of a solid subject to no restraints, and a brief chapter on an extension to the motion of a deformable system.

The seventh part, on the dynamics of physical solids, is devoted principally to a discussion of friction. The theory of elasticity is given in the eighth part, and the volume is concluded by the ninth part on the mechanics of fluids.

W. R. LONGLEY.

*Les Théories statistiques en Thermodynamique.* Par H. A. LORENTZ. Leipzig, B. G. Teubner, 1916. 120 pp.

DELIVERED at the Collège de France by Lorentz in 1912,

reported and edited by L. Dunoyer in 1913, and finally printed by the author in 1916 with a mathematical appendix supplementing the text, these lectures may be characterized as a frank discussion of some of the most troublesome points in recent thermodynamical theories. Lorentz never throws dust in the reader's eyes; whatever is doubtful is plainly so labeled; that which is tentative is distinguished from that which is settled; the physical ideas are discussed with a minimum of mathematics, and all extended analytical work is reserved for the appendix, where it can neither befog nor interrupt the even tenor of the work.

The relation of entropy to probability in classical thermodynamics, with applications to monatomic gases and other substances, the effect of the size of molecules, the comparison of two possible definitions of probability (Boltzmann and Einstein), canonical ensembles (Gibbs), and fluctuations in statistical phenomena are treated in the first three lectures. The last topic is of great importance and of recent development, with applications to the emission of $\alpha$ particles, to the scattering of light, to Brownian motions, and to black body radiation (fourth lecture). The initial impulse in this field has been largely due to Einstein. Lorentz's connected exposition will be welcomed. A treatment of Planck's formula and of the theory of quanta, admirably honest, closes the set of five suggestive lectures. There is philosophy as well as physics in the work.

There is no other text which can be recommended as comparable with this for clarifying ideas in a very opaque field, and no great knowledge of mathematics or physics is a necessary preparation for enjoying the book, for sensing the exhilarating boldness of some recent theories, and for discerning possible directions of escape from present perplexities.

E. B. WILSON.

*The Theory of Electrons and its Applications to the Phenomena of Light and Radiant Heat.* By H. A. LORENTZ. Second Edition, Leipzig, B. G. Teubner, 1916. 343 pp.

THIS second edition of Lorentz's Theory of Electrons is practically identical with the first edition, except for a few changes in the footnotes and in the mathematical appendices or notes, which follow the main text. For the most part these changes are for the purpose of giving a clearer state-