L'Idée Générale de la Mécanique Ondulatoire et de ses Premières Applications. By Marcel Boll. Paris, Hermann, 1932. 74 pp.

Théorie de la Quantification dans la Nouvelle Mécanique. By Louis de Broglie. Paris, Hermann, 1932. viii+250 pp.

The first of these books attempts to give in very short compass and for non-specialists an idea of the general principles underlying wave mechanics. On the whole the attempt is successful, and the very brevity and lack of detail involved have the merit that a reader will wish to study more detailed treatments after having read this little book. The following chapter headings indicate sufficiently the topics treated. I. La liason entre la mécanique et l'optique. II. Les relations d'incertitude. III. Les niveaux d'énergie. IV. Valence et affinité chimiques. V. La conduction électrique des métaux.

The book by de Broglie is an authoritative account of the subject by one of its creators. After an historical introduction, the first chapter gives a clear presentation of the connection between mechanics and geometrical optics, and ends with the general wave equation for a single particle. The second chapter gives the probability interpretation of the wave function and Heisenberg's uncertainty relations. Chapter III shows how to treat a dynamical system made up of a number of particles, and Chapter IV describes Schrödinger's method and Heisenberg's matrices. The rotator and simple harmonic vibrator (in one, two, and three dimensions) are treated in Chapter V, and Chapter VI deals with the hydrogen atom. Chapter VII, which concludes the first part of the book, discusses briefly the method of perturbations and the principle of interference.

The second part of the book is devoted to more abstract methods. Chapters VIII and IX treat, respectively, of real and complex vectors in a space of n dimensions, and introduce the matrices, orthogonal and unitary, which correspond to a transformation of coordinates. Chapter X extends these notions to functional space in which a vector, or point, is an integrable complex function of one or more real variables. The concept of a system of orthogonal functions is introduced, but no real mathematical treatment is given. It is simply assumed that all the functions discussed are developable in terms of the orthogonal functions considered. The same lack of mathematical detail shows itself in the discussion of the infinite matrices which correspond to a change from one set of orthogonal functions to another. Thus (p. 131) in introducing the product of two infinite matrices, an interchange in the order of summation, as if the matrices were finite, is made without comment. Chapter XI discusses matrices whose characteristic numbers include all the points of an interval and introduces Dirac's delta function. The reviewer feels that it is high time that the elements of Stieltjes integration be taught to physics students, so that such paradoxes as those concerned with Dirac's function may be avoided. The last chapters treat systems with constant external fields, mean values, the uncertainty principle, operators independent of the time, non-conservative systems, operators dependent on the time, and the general theory of first integrals.

On the whole, this is perhaps the best introduction to wave mechanics which has yet appeared. It is much less difficult than Dirac's book, and after reading it, Weyl's *Gruppentheorie und Quantenmechanik* should prove much easier to study. The appearance of the volume is all that could be desired.

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