

**Fondamenti della meccanica atomica**

Per Enrico Persico. (Trattato generale di fisica a cura del Consiglio Nazionale delle Ricerche.) Pp. iii+510. (Bologna: Nicola Zanichelli, 1936.) 80 lire.

IN the development of a comparatively new subject, such as quantum mechanics, advances are made by a few brilliant pioneers, each working on his own lines. At this stage it is very difficult for a student of average attainments to grasp the subject as a whole. We owe a deep debt of gratitude to Dr. Persico for undertaking the useful task of presenting, in a single volume of reasonable size, a unified account of all aspects of the subject.

The book is divided into three parts. The first, which is very easy reading, describes the fundamental experimental results, and the simple Bohr theory of the hydrogen atom. The second part opens with a mathematical discussion of orthogonal functions, and then develops Schrödinger's wave equation. The applications include the harmonic oscillator, the hydrogen atom, and other problems of a single particle. A good example of the author's skill in correlating his material is the way in which an approximate treatment of the wave equation leads on to the Sommerfeld conditions of the older quantum theory and their application to elliptic orbits. This order violates the historical development, but it makes things much easier for the student.

The third part is the most difficult. It opens with a discussion of functional and Hilbertian space, linear operators and matrices. It then explains Dirac's ideas of observables. After further developments of the matrix method, we pass to the theory of perturbations. Another chapter deals with relativity, spin, and Dirac's linear wave equation, and the final chapter with Pauli's principle. The book concludes with a bibliography and an index.

There are a few places where more advanced students would desire a fuller treatment, but the only serious defect of the book is that it is in Italian. Will some publisher consider the possibility of an English translation? H. T. H. P.

**Croydon Natural History and Scientific Society**

Regional Survey Atlas of Croydon and District. Pp. 19+12 plates+Locator template. (Croydon: Roffey and Clark, Ltd.; London: Thomas Murby and Co., 1936.) 12s. 6d.

FOR several decades, the Croydon and District Natural History Society has been to the fore in advocating the importance of regional survey. In the view of Mr. C. C. Fagg, such a survey need never be complete but can continue to record facts on outline base maps and the maps listed and classified according to a scheme which, in its decimal system, recalls the Dewey system for books. A start has been made with the publication of some of the material collected; a substantial binder has been issued together with the classification scheme, specimens of the base maps (one covering a limited area on the one-inch scale, the other a larger area on the half-inch scale, both being reproductions of the Ordnance Survey maps in grey), a geological map and an

outline on transparent paper, map of rivers, rainfall map and map of Roman roads. There are valuable notes on each map and a half-tone reproduction of Say's "Plan of Croydon" (1785).

This is a promising start, though regrets must be felt that so much of this material is available in maps of the Geological and Ordnance Surveys. Issues of new maps, to be distributed at a price varying with the cost, are promised from time to time. A glance at the classification scheme suggests that difficulties may arise—thus 82 includes land (tenure, ownership, utilization, value)—and that modifications may be needed. L. D. S.

**Easy Methods for the Construction of Magic Squares**

By Major J. C. Burnett. Pp. 77. (London: Rider and Co., 1936.) 2s. 6d. net.

IT is rather difficult to describe this little book. It is in no sense a systematic discussion of the construction of magic squares. Rather it consists of a series of examples to show how, by the method of 'complementary differences', a variety of problems relating to these squares may be solved; and it attempts no general theoretical discussion. Starting with the construction of an associated magic square of the fifth order, that is, one in which the sum of two numbers placed symmetrically with regard to the centre of the square is constant, the author proceeds to discuss bordered squares, magic rectangles and the like, in each case by particular examples. The language of the book is described as non-technical. This is a fair description, in the sense that the book lacks the precision of statement usually expected in mathematical works. For example, the use of the verb "to be" in the definition "Reversions are when the Squares are merely turned round . . ." is surely an archaism; and there are several other places where, though the author's intentions are clear, his explanations do not conform to modern grammatical standards. J. A. TODD.

**An Elementary Chemistry**

By A. H. B. Bishop and G. H. Locket. Pp. 398. (Oxford: Clarendon Press; London: Oxford University Press, 1936.) 4s. 6d.

THIS is a text-book written by teachers who have aimed at making the subject interesting and also are aware of the usual difficulties encountered by young pupils. It includes details of a number of instructive experiments which can be performed in the classroom or laboratory, and the many little hints given in these descriptions show that the authors appreciate the conditions under which the experiments will be successful. All teachers will be well advised to have a copy of this book, if for no other reason than the help they are likely to obtain from the descriptions of the experiments. Emphasis is laid on everyday aspects of chemistry and there are some excellent plates of industrial apparatus, etc. The text is clear and well arranged, and there is a good selection of examination questions. The treatment throughout is from the modern point of view and the arrangement of topics will be found to work well in actual teaching.