CONTEMPORARY PHYSICS

Introduction to Contemporary Physics. By Karl K. Darrow. (Macmillan & Co., London), 1939. Second edition. Pp. 648. Price 25*sh.*

CONTEMPORARY PHYSICS is in large measure the physics of the atom. It was developed with great rapidity, and one cannot help but admire the valiant authors who from time to time have endeavoured to portray this kaleidoscopic scene, and mark out a path for the student to walk in. The decade of the twenties saw the first editions of many well-known books, which, though inevitably out of date almost as soon as they were printed, provided many of us with our first introduction to this fascinating field.

We have now reached the stage where the ephemeral books have disappeared altogether, and the better ones are passing into second and third editions. The volume under review is a case in point. The first edition was published in 1927, and the present volume, dated 1939, is the second. To compare the two is to see at a glance the astonishing progress that has been made in the intervening twelve years. The number of pages has grown from 453 to 648, but this hardly indicates the fundamental character of the changes. The new edition is not merely the old, with an addendum of 200 pages, but is essentially a new book. Facts known in 1927 are still facts, but as understanding of them has grown, so the interpretation placed upon them has changed. Accordingly Dr. Darrow has revised, and in large measure re-written, the whole text.

It may be said at once that the book in this edition retains those excellent features which made it so useful to students a dozen years ago. Dr. Darrow has an enviable gift of clear and succinct expression, in spite of an occasional fault of syntax and the introduction of neologisms such as 'uniformize'. But the latter are rare, and as a whole the book is extremely readable. The chapter 'Introduction to Wave-Mechanics', for example, is an instance of lucid exposition which can be read by the intelligent beginner with sustained interest.

A substantial part of the subject-matter, roughly the contents of the first half of the book, was in the old edition. Comparing for example the present chapter on the Analysis of Spectra with the corresponding one in the former edition, we find that whereas the paragraphs may for many pages follow the same order, in much the same language, there is evidence in a host of minor alterations of a painstaking and detailed revision.

The essentially new matter starts with wave-mechanics, and carries the reader on through the whole development of nuclear physics. Stress is laid more on the experimental facts and their general interpretation, and there is little or no attempt to dip into the theory of the nucleus. This method is doubtless right for a book of this type; the theories are in a state of flux, and possibly the third edition will provide an opportunity to discuss them. The experimental work is well selected and described, and the reader gets a very clear picture of the present position regarding such matters as nuclear transmutation and nuclear spins. The most striking omission is cosmic radiation, which obtains only incidental mention in connection with the positive electron. The omission is possibly deliberate, in view of the size of the book, but it is to be regretted, for cosmic radiation now looms very large in our picture of contemporary physics.

Readers of the old edition will regret the disappearance of the concluding chapter on the conduction of electricity through gases, which was a very useful summary of that subject, but many of its topics are mentioned at appropriate points in the new edition.

To those who used this book in its earlier form no commendation is necessary. To new readers it may be unreservedly recommended as an extremely interesting and reliable account of almost the whole field of atomic physics. It should in particular be read by honours students who desire not merely a compendium of facts, but a book which will bring them a wider and deeper understanding of the methods and the ideas which underlie the remarkable developments of contemporary physics. H. J. T.