

Dialogue Concerning the Two Chief World Systems, Ptolemaic and Copernican

By Galileo Galilei. Translated by Stillman Drake. Pp. xxvii + 505. (Berkeley and Los Angeles: University of California Press; London: Cambridge University Press, 1962.) 2.95 dollars; 24s.

FOR the past ten years, English-speaking students have had two translations of Galileo's masterpiece, each with its merits and weaknesses. De Santillana's edition of a seventeenth-century translation offers a more exciting display of erudition in the notes, but the text itself puts a barrier between the modern reader and Galileo. The present translation is readable and reliable throughout, based on Mr. Drake's deep knowledge of the details and background of Galileo's struggles and achievements.

If the *Two Chief World Systems* has one fault, it is its length. Especially towards the end, it becomes involved in technicalities which are of no interest to the general reader. De Santillana has remedied this in an abridged paperback version of his edition.

A general principle would be to read the first two "Days" closely; there is contained Galileo's exposition of his new method for achieving truth by "sense experience and necessary demonstration". There is also Galileo's picture of the official natural philosophy of the time. Although it is biased, it is not really misleading.

This reprint costs only a fraction of the price of the original volume, and so is to be welcomed. But as a piece of bookmaking it cannot be commended. The reduction in size of the original pages makes the print inconvenient to read. The binding is simply glue with individual page-ends stuck in. Other paperback publishers can produce inexpensive books designed to stand up to wear, and there is no excuse for inferior workmanship in books of this quality issued by such reputable publishers.

J. R. RAVETZ

The Interpretation of NMR Spectra

By Dr. Kenneth B. Wiberg and Bernard J. Nist. Pp. vii + 593. (New York: W. A. Benjamin, Inc., 1962.) 25 dollars.

THE high-resolution hydrogen resonance spectra of organic compounds are sometimes simple and easy to interpret. Sometimes, however, it is found that the spectra are complex, and cannot be interpreted in an obvious way in terms of the molecular structure. This occurs when the spin-spin coupling constants between chemically shifted nuclei are comparable with the chemical shifts between them in the magnetic fields available. In order to obtain the chemical shifts and coupling constants it is then necessary to apply relatively sophisticated procedures to analyse the spectra. The methods are now well known, but because they often involve successive approximations, it is still frequently a laborious process.

The authors of this book have programmed a computer to calculate the spectra corresponding to the so-called AB , AB_2 , ABC , AB_3 , A_2B_2 and AB_4 cases for a range of values of J/δ up to 3 including some cases with negative coupling constants. The results are presented in this book in the form of the resulting patterns. If one has, for example, an A_2B_2 spectrum, it is then only necessary to study the various patterns presented for this case and to compare them with the experimental observations, in order to obtain a value for the ratio of the coupling constant to the chemical shift. Their separate values can then be obtained by a simple scaling procedure. It is then a relatively simple matter to use well-known methods to obtain more accurate values if they are required.

1,079 spectra are included in this volume, which will undoubtedly be of great value to all those who have to analyse complex high-resolution spectra.

R. E. RICHARDS

The Mossbauer Effect

A Review, with a Collection of Reprints. By Dr. Hans Frauenfelder. (Frontiers in Physics—a Lecture Note and Reprint Series.) Pp. xiv + 336. (New York: W. A. Benjamin, Inc., 1962.) 3.95 dollars.

THE history of the Mössbauer effect is a strange one. The existence of this mode of nuclear resonance absorption might have been predicted during the 1930's and particularly after a paper by W. E. Lamb in 1939. Instead, the effect was discovered by R. L. Mössbauer in 1958, a discovery for which he was awarded the Nobel Prize for physics in 1962. In 1960, it was realized that there were several nuclei, notably iron-57, in which the effect is very much more easily observed than in iridium-191, the nucleus with which Mössbauer was working, and laboratories in many parts of the world started programmes utilizing the effect. The result was such a spate of papers that one journal refused to take any more contributions on the effect.

Two-thirds of this book of 336 pages are devoted to reprints of the most important of this original flood of papers. These are divided into six sections roughly according to whether the interest lies in the history of the effect, its theory, applications to crystal investigations, the investigation of the nuclear properties of iron-57 and some other nuclei, the investigation of the predictions of relativity and quantum theory, or the investigation of hyperfine fields. The first hundred pages give a survey of all these subjects written in a somewhat racy and readable style.

The book has appeared at the right moment. The easy and dramatic experiments have all been performed, papers now appear much more slowly. To those who are interested in experiments utilizing the effect, the book provides a good account of the present state of the subject.

T. E. CRANSHAW

Methods of Biochemical Analysis

Vol. 10. Edited by Prof. David Glick. Pp. ix + 309. (New York and London: Interscience Publishers, a division of John Wiley and Sons, 1962.) 109s.

THE apparatus and methods used in the techniques applied to biochemical analyses are extremely varied. The subject-matter of this book shows that they may cover such diverse topics as the separation of substances by the methods of gas-liquid partition chromatography, dialysis or counter-current distribution; the localization of materials within the living cell by the fractionation of cell particles or by histochemical techniques; the chemical determination of the functional and prosthetic groups of proteins or the concentration of inorganic ions in biological fluids; the kinetic investigation of enzyme reactions and the measurement of the activity of enzyme systems. For these methods to be applied intelligently an appreciation of the theoretical background of the technique is essential and this entails a wide knowledge of the physical and biological sciences. Each subject discussed in this volume is developed lucidly from elementary principles and the essential theory of the methods is clearly and concisely derived.

Normally the application of a complex new method to a particular research problem involves considerable hard and tedious work whereby one practical procedure after another is varied to fit the individual needs of the particular experiment. In addition, all too often particular difficulties are encountered because of the lack of details of the exact method in the published account. The description of the procedures given in this book are clear and thorough and in all cases they show that the subject is discussed by an author who through an intimate working knowledge of the method appreciates the difficulties which can arise and is thus able to point out the pitfalls for the inexperienced.