

Books

Nuclear Magnetic Resonance. By E. R. Andrew. 265 pp. Cambridge U. Press, New York, 1955. \$6.50. *Reviewed by H. Y. Carr, Rutgers University.*

New and experienced workers alike have awaited the publication of a comprehensive introductory book in the field of nuclear magnetic resonance. A voluminous collection of articles concerned with a wide variety of subjects has been published in the relatively brief period since Bloch, Purcell, and their co-workers performed the initial experiments in 1945. Ten years later nuclear magnetic resonance still continues to provide valuable means of solving new problems. This is true not only in fundamental physics and chemistry but now more than ever before also in a rapidly expanding group of industrial applications. As a result many workers frequently face the difficult task of obtaining from the extensive literature an introductory survey of nuclear magnetic resonance.

Andrew's excellent book is an immense help in this situation. He gives a concise lucid introduction to a large number of important subjects in nuclear magnetic resonance—the basic theory, experimental techniques, nuclear relaxation, chemical shifts, crystal structure, conduction electron effects in metals, quadrupole effects, etc.

One of the outstanding features of the book is the very careful indication with each subject of the relevant original papers published in the journals. These references mentioned in the text are listed at the end of the book in an excellent bibliography and author index.

Several important conclusions are evident. The book will be extremely useful to new students in the field, both those seeking a general introduction and those desiring guidance for exploring more intensively in the original literature some particular subject. For these same reasons the book will serve as a very valuable reference for every worker in the field.

Messen und Rechnen in der Physik. By Ulrich Stille. 416 pp. Vieweg-Verlag, Braunschweig, Germany, 1955. DM 54.00. *Reviewed by William F. Meggers, National Bureau of Standards.*

Quantities and units determine the representation of physical relationships as well as the evaluation of experimental or theoretical data. Since the introduction of quantities and the definitions of units are largely a

matter of convention it might be assumed that unanimity had been achieved, but a glance at manuals, textbooks, and other publications shows that many divergences still exist in the treatment of physics and technics. For example, many physicists treat inertia and weight as two different manifestations of mass, while others regard them as independent quantities in acceleration mechanics and gravitation. In heat science a distinction between thermodynamic and empirical temperatures, and their corresponding temperature scales, continually appears. The widest divergences occur in electrodynamics, especially about units when the fundamental questions of concepts and quantities are considered. In order to explain such disagreements and avoid misunderstandings Ulrich Stille has published a scholarly study of the entire subject of measuring and calculating in physics. This study embraces all the domains of physics; it gives the complete history, up to 1955, of the development of modern physical concepts, laws, quantities, and units. Part One (36 pp) is devoted to fundamentals and definitions, Part Two (53 pp) to mechanics, Part Three (47 pp) to heat and radiation, Part Four (101 pp) to electricity and magnetism, Part Five (48 pp) to acoustics and phonometry—optical radiation and photometry, Part Six (99 pp) to values of constants and Part Seven (55 pp) to tables of constants, symbols, units, conversion factors, etc. A bibliography of 984 items, and a detailed subject index to more than 2000 items, ranging from Aberrationskonstante to Zyklotronfrequenz, conclude this incomparable volume.

Gas Dynamics of Cosmic Clouds (Symposium, Cambridge, England, 1953). Edited by J. M. Burgers and H. C. van de Hulst. 247 pp. (North Holland, Netherlands) Interscience Publishers, Inc., New York, 1955. \$5.75. *Reviewed by P. Morrison, Cornell University.*

At Cambridge University in the summer of 1953 the second of these joint symposia, which unite astronomers and aerodynamic physicists, was held, with signal success, but with more than enough left undone to plan for another such symposium in 1957. Here is the well-printed and handsomely illustrated report of the papers and discussion, a little late, but very welcome. The forty-odd papers may be summarized with some effort under some half-dozen heads. First comes the status of the observations of gas and dust, in their several dark and shining aspects, as the observers see them. Here the picture, of incipient stars and globes of dust, of shining nebular edges and of the hydrogen clouds in deep space, are alone worth the price of admission. Then the radiative and kinetic energy budget of the gas is drawn up, and its turbulence, its magnetization, and its density variations discussed. The motion of shocks in space, and their interaction, is discussed, with reference to the laboratory experiments of Kantrowitz and others on glowing and conducting shock fronts in the laboratory. This physical background is assembled