

portant role in the microwave field. Without going into too many details of microwave ferrites, Ghose gives a very good theoretical introduction to this field. An appendix with a paragraph on dielectrics in microwave circuit elements, a table on dielectric constants (lacking mention of Teflon!), and an index of subjects close the book.

Summarizing, Ghose's book on microwave circuit analysis is a very well written text and can be highly recommended as a basis for an introductory course on a somewhat advanced level. Well-selected references to publications and problems to each chapter are stimulating, but the student will need some advice to be able to solve the problems. The microwave engineer can also consider the book a useful addition to his library.

Rutherford at Manchester. J. B. Birks, ed. 364 pp. (Heywood, London) Benjamin, New York, 1963. \$12.50. Reviewed by E. Segrè, University of California, Berkeley.

IN the life of Rutherford, there are three distinct periods. The first at Montreal was devoted to the disentanglement of the phenomena of radioactive disintegration; the second at Manchester saw the establishment of the concept of the nucleus and of the nuclear atom and the first artificial nuclear disintegration; the last at Cambridge was connected with the first accelerators, the discovery of the neutron by Chadwick, and the beginnings of large-scale operations in physics.

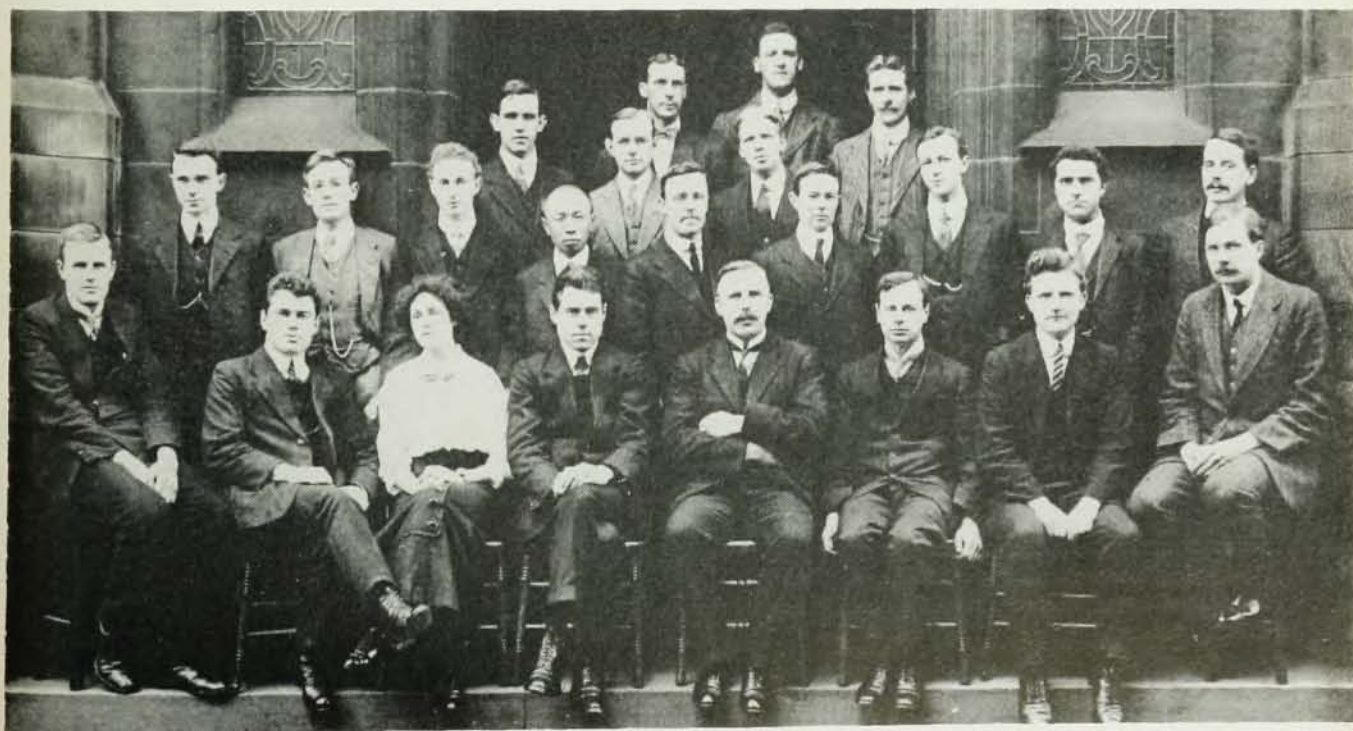
Of these three periods, the Manchester one from 1907 to 1919 is probably the most typical and certainly the greatest in Rutherford's life. In 1961 there was a

conference at Manchester commemorating the 50th anniversary of the discovery of the atomic nucleus. On that occasion Sir Ernest Marsden, Sir Charles Darwin, E. N. da C. Andrade, and Niels Bohr, four of Rutherford's former colleagues who participated in the work before World War I, spoke at the commemorative session. Their speeches form about one quarter of this book. Another quarter is composed of Rutherford Memorial Lectures by H. R. Robinson, A. S. Russell, P. M. S. Blackett, and again Niels Bohr. The remainder of the book contains reprints of some of the most famous papers of Rutherford, Moseley, Bohr, Geiger, and Marsden.

Each of these papers represents a milestone in physics: the discovery of the nucleus, the quantum explanation of the hydrogen spectrum, the discovery of the atomic number, and the first artificial nuclear disintegration. Finally, we find a list of the publications from the Manchester Laboratory during the time of Rutherford. The list gives an insight into the constellation of young physicists that gathered around the master at that time.

Any professional physicist and many laymen inter-

Staff and research students of the Manchester University Physics Department in 1913. Front row: H. Robinson, D. C. H. Florance, Miss M. White, J. N. Pring, Prof. E. Rutherford, W. Makower, E. J. Evans, C. G. Darwin. Second row: A. B. Wood, E. Green, R. H. Wilson, S. Oba, E. Marsden, H. Gerrard, J. Chadwick, F. W. Whaley, H. G. J. Moseley. Third row: H. Richardson, J. M. Nuttall, B. Williams, W. Kzy. Fourth row: T. S. Taylor, A. S. Russell. (Illustration from the book *Rutherford at Manchester*)





The Two-Nucleon Interaction

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Oxford University Press • New York

ested in science will be delighted with this book which faithfully re-creates one of the most fruitful and dramatic periods in the development of physics. It will seem almost incredible to the post-war generation of physicists that the memorable experiments and theories presented are only about 50 years old and that not so long ago in nuclear physics it was possible to make such momentous discoveries by Rutherford's proverbially simple means.

Ergodic Theories. Proc. of the Internat'l School of Physics "Enrico Fermi" (Varenna, Italy, May 1960). 241 pp. Academic, New York, 1962. \$7.50. *Reviewed by Robert J. Rubin, University of California at San Diego.*

TO physicists, ergodic theory in statistical mechanics is inextricably linked with the notions of irreversibility and approach to equilibrium. This close connection is apparent in the book under review in which more than half of the space is devoted to ergodic theory (classical theory: Truesdell; quantum theory: Ludwig, Loinger, and Uhlhorn). The remainder of the book consists of excursions into the real world of molecular chaos, master equations, diagonal singularities, and density expansions (van Hove, Verboven, Cohen, Lebowitz, Falkoff, and Résibois), with a level-headed lead article by Rosenfeld, "Questions of Irreversibility and Ergodicity". As Course 14, *Ergodic Theories*, in the Italian Physical Society's International School of Physics "Enrico Fermi", the book is a success.

A Physical Theory of the Living State: The Association-Induction Hypothesis. By Gilbert Ning Ling. 680 pp. Blaisdell, New York, 1962. \$17.50. *Reviewed by R. B. Lindsay, Brown University.*

MODERN biophysics and biochemistry rest on the assumption that the behavior of the living cell as the unit of life can be accounted for by the use of the fundamental principles of physics and chemistry. Much success has been achieved by the hypothesis that all living systems consist predominantly of proteins, water, and salt ions, and that the behavior of such systems depends in the last analysis on the interaction of these components. For some time, a widely held theory has postulated that these interactions are essentially a long-range affair in the accepted physico-chemical meaning. The author of the present work is inclined to disagree with this view. He believes that the available experimental evidence points rather to the plausibility of the assumption that in the living cell the system of proteins, water, and ions must exist in close association, implying the interplay of short-range interactions. The author works out in detail the consequences of this point of view, supplemented also by the use of another motion which he calls the inductive effect. The latter term means essentially the influence of polar groups in the protein molecule carrying net electric charges on the distribution of free electrons.