Book Reviews

A Collation of Physics

A Festschrift for I. I. Rabi. LLOYD MOTZ, Ed. New York Academy of Sciences, New York, 1977. x, 244 pp., illus. Paper, $25. Transactions of the New York Academy of Sciences, Series II, vol. 38.

Being a physics graduate student at Columbia University in the late '30's and early '40's was pretty heady stuff. New York was still the gateway into the U.S.A., and through the portals of the Pupin Laboratories passed most of the great figures of European physics, some for short pauses, others to stay a while. The incomparable Fermi, newly arrived and temporarily bored with the enterprise of cataloging slow neutron resonances (fission was just on the verge of being discovered), was having fun exploring new fields, from cosmic rays to geophysics, by giving graduate courses in them. Though earning their livings by teaching in the many public and private colleges in the area (and sometimes even in the high schools), a score or more of brilliant young theorists and experimentalists concentrated their research activities around the seminars and laboratories at Columbia.

Presiding over this intellectual smorgasbord was I. I. Rabi. His direct research interests were in the measurement of nuclear moments by use of atomic and molecular beams, but his voracious appetite for good and interesting physics led to the cultivation and encouragement of exploration in all branches of modern physics by the graduate students, postdocs, and visiting research associates at Columbia. This catholicity of interest is well reflected in the volume here under review.

It would, in fact, be difficult to find a wider-ranging set of essays than the 19 contained in this festschrift, or a more distinguished set of authors. What is remarkable is that from an article on superfluid motions by M. Rasetti and T. Regge to one on physical interpretations of general-relativistic theories by P. G. Bergmann they all seem to hang together, perhaps through the common thread of Rabi's continuing emphasis on understanding the physics behind the detail.

Given the vast heterogeneity of subject matter, the editor has obviously decided that the only possibly rational ordering was one determined by the alphabetical sequence of the names of the leading authors. This results in a remarkable randomicity. Thus, following the aforementioned article by Bergmann, the next three are "The hyperfine structure of the ground state of orthohelium in the nonrelativistic approximation" by G. Breit, V. G. Kaveeshwar, and R. P. Singh, "The predicted infrared spectrum of HeH^+ and its possible astrophysical importance" by I. Dabrowski and G. Herzberg, and "Parity-violating electromagnetic interactions of nuclei" by G. Feinberg.

Of course, Rabi's immediate research interests and their direct outgrowths are by no means neglected. There is a modestly low-key but very informative history of the formative years of Rabi's Columbia researches in "Recollections of a Rabi student of the early years in the molecular beam laboratory" by S. Millman, together with "The fine structure constant" by V. W. Hughes, "Some history of the hydrogen fine structure experiment" by W. E. Lamb, Jr., and "The electric and magnetic dipole moments of the neutron" by N. F. Ramsey, as well as an (historically early) exhibition of analytical virtuosity in "The Majorana formula" by J. Schwinger, in which the mysteries of angular momentum formalism are rescued from the mystique of formal group theory and restored to physically familiar quantum language.

More recent indications of Rabi's abiding interest in the theoretical frontiers are to be found in the group of papers on particle theory by some of its foremost expositors: "Vector and tensor gauge particles in SL(6,c) theory" by C. J. Isham, A. Salam, and J. Strathdee, "Algebraic incompatibilities between Arnowitt-Nath gauges and supersymmetrized gravity" by Y. Ne'eman, and "The problem of mass" by S. Weinberg. And going from the ultramicroscopic to the cosmic, we have "A diamond as big as the Ritz" by E. Flowers, A. Ray, M. Ruderman, and E. Spiegel and "A few specializations of the generic local field in electromagnetism and gravitation" by J. A. Wheeler, with brief stopoffs in the nuclear, the atomic, and the macro-matter domains—"Notes on the statistical distribution of single population level spacings and level widths" by J. Rainwater, "Quantization of the damped harmonic oscillator" by H. Feshbach and Y. Tikochinsky, and "About liquids" by V. F. Weisskopf. Finally, there is a brilliant essay on the early history of radioactivity studies in "Radioactivity's two early puzzles" by A. Pais.

Altogether, a veritable feast. One might well ask what is the specific Rabi imprint, except for quality, on such a variegated and apparently unstructured collection. The answer lies in the common denominator of what Rabi imbued in his students of that era. "You're not going to get either fame or fortune out of physics," he insisted to us. "You'll work hard and long hours. There is only one reason for going into physics and this is if, above all other activities you can think of choosing, physics is the most fun." *Fun* is the common denominator of Rabi's festschrift, as it has been of his life in physics.

BERNARD T. FELD
Department of Physics, Massachusetts Institute of Technology, Cambridge 02139

Protein Evolution

The Evolution of Metalloenzymes, Metalloproteins and Related Materials. Proceedings of a symposium, Sussex, July 1977. G. J. LEIGH, Ed. Symposium Press, London, 1977. iv, 118 pp., illus. Paper, $7.70.

This slight paperback contains six contributions presented by British scientists at a symposium organized by the Inorganic Biochemistry Discussion Group of the Chemical Society at the University of Sussex. Four of the six contributions deal with the evolutionary implications of the variations in the amino acid sequence or conformation of the protein moieties between different organisms rather than with the possible influence of metal binding on the course of protein evolution.

Two of the chapters on protein structure, that by K. K. Rao and D. O. Hall on the chemistry and evolution of ferredoxins and hydrogenases and that by R. P. Ambler on cytochrome c and copper protein evolution in prokaryotes, are expectably good, although neither adds much to other recently published reviews by these authors. In both, data are discussed in relation to the generally ac-