Roster of winners

NOBEL LECTURES IN PHYSICS, VOL. 1: 1901–1921. 498 pp. American Elsevier, New York, 1967. $85.00 for 3-volume set

by Morris E. Rose

This volume is one of a series in which are to appear the lectures of the Nobel laureates in each of the five disciplines for which the prize is awarded. In each category there are to be three volumes covering 1901–21, 1922–41 and 1942–61, respectively. From 1962 onwards the annual Nobel lectures will be collected in a yearbook. All lectures are translated into English, and each lecture is accompanied by a short presentation address and a brief biography of the prize recipient.

At various times in the past the attitude prevailed that physics had reached a state of perfection such that little remained for future generations but to fill in details in a noble edifice reared by their predecessors. This was very nearly the concensus when the first Nobel prize was awarded. At other times physicists have been only too aware of the incompleteness of our descriptions of nature but that the problems have been so difficult that little progress could be expected on a short time scale and that real progress must await another breakthrough such as occurred in the middle of the third decade of this century. A perusal of the work of the Nobel laureates, on the whole, serves to demonstrate the shortcomings of both points of view. To be sure, there may be some pressure to award a prize with few lapsed years. Indeed, in the history of this competition only six years were distinguished by the absence of a physics award, and of these four (1916, 1940–42) were war years. Presumably in 1931 and 1934 no great achievement was discernible either as a recent work or as one less recent but only newly recognized as important. Nevertheless, the achievements for which the prize in physics has been awarded are in every case of undoubted importance and in almost every case of extremely great importance.

This was certainly true in the first two decades covered in the present volume. Certain puzzling circumstances, well-known to all physicists, can be cited, of course. Notable among these was the omission of Rutherford from the roster of physics prize winners although as early as 1908 he appears as a chemistry award winner for his work in radioactivity. Yet what could be more worthy of a physics prize than his work on alpha-particle scattering leading directly to the discovery of the nucleus? Einstein's clarification of the photo-electric effect was worthy of a prize (1921), but one is puzzled by the apparent lack of appreciation of special relativity reported in the same year. Incidentally, Einstein's lecture, delivered two years after the award, was not meant to be associated with the award and is concerned entirely with the problem of relativity, both special and general. A unique insight into the mechanisms of selection is obtained in the book "Nobel–The Man and his Prizes," H. Schück et al (Elsevier), which is worth reading in conjunction with the present work.

As to the lectures presented here, little need be said other than the fact that they constitute a series of vignettes testifying to the fact that physics was as difficult in this bygone era as it is now. Each lecturer describes in a not overly technical manner the path by which he was led to his result. It was not always the original goal, but that is the way discoveries are made.

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Morris E. Rose is Robert C. Taylor Professor of Physics at the University of Virginia.

History of kinetics

KINETIC THEORY. Vol. 1, The Nature of Gases and of Heat. Stephen G. Brush, ed. 249 pp. Pergamon Press, Oxford, 1965. Paper. $4.95

by George H. Weiss

The value of collections of famous, but dated, papers of historical interest has always struck me as being problematic. Without denying the possible utility of such collections to those with interest in the history of science, it is difficult to see that most of the papers will be read profitably by anyone else.

This collection begins with the monumental papers by James Clerk Maxwell and Ludwig Boltzmann that laid the foundations of kinetic theory. However, to modern eyes the papers seem long, tedious and no more enlightening than more recent expositions of the same subject matter. Other papers in this collection include one by Lord Kelvin showing that it is impossible for large temperature to arise spontaneously, two by Poincaré, of which one introduces the notion of the Poincaré cycle, and finally, the exchange of papers by Boltzmann and Zermelo on the possibility of irreversibility in a universe ostensibly described by differential equations that are second order in time. These papers *are* of considerable interest, if only because they show that Zermelos' objections were not as decisively refuted as current dogma would have it.

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George Weiss is chief of the Physical Sciences Laboratory, National Institutes of Health, Bethesda, Md.

New biophysics

THEORETICAL AND EXPERIMENTAL BIOPHYSICS: A SERIES OF ADVANCES, Vol. 1. Arthur Cole, ed. 397 pp. Marcel Dekker, New York, 1967. $17.50

by Joseph G. Hoffman

The preface asks why biophysics might not be called bio-mathematical-physical-chemistry, or by some other shuffling of the four terms. And well it might because the six review papers, of immediate interest to all bio-physicists, exemplify the subject's interdisciplinary complexity.

The first paper, "Water Structure," by Herman J. C. Berendsen discusses a problem first posed by Wilhelm C. Roentgen in 1892. Though he is not mentioned, Roentgen's concept of water structure is still valid. The problem still is: how to fit the numerous, though tenuous data, into a quantitative theory. Berendson gives a concise review of current major theories and their relation to the facts. The addendum shows that all theories are under continuous and close scrutiny and that they are subject to modification with the next data. There is as yet no theoretical formulation that can