
This is a small book, cheaply priced for a hardback and easily devoured in an evening of pleasant reading. It consists of three lectures; somewhat more than half the book is devoted to Salam’s 1988 Dirac Memorial Lecture, with the remainder offering welcome reprints of lectures by Werner Heisenberg and by Paul Dirac himself, both from 1968. The common theme of these lectures is that of the process of scientific discovery, in each case given through non-technical accounts of the major discoveries with which the respective authors are associated.

Hence Salam takes as his theme the unification of fundamental forces, tracing the development of the ‘standard model’ from the early days of the disparate electromagnetic, weak, and strong nuclear forces through to its current status, unchallenged (at least as I write this!) by any particle physics experiment. Pivotal in this progression was the first unification of electromagnetism and the weak interaction by Salam, Glashow, and Weinberg, among others, and particular attention is paid to this development. Salam manages, with apparent ease, to describe the particles, interactions, and implications of the standard model without recourse to a single equation. In doing so, he cannot fail to clarify the reader’s perception of this elegant theory, which is surely destined, in some form or other, to survive in any future description of particle interactions.

The lectures of Heisenberg and Dirac concentrate on an earlier era — that of the discovery of quantum mechanics. For me, Heisenberg’s lecture is the real gem of this collection, with his account of the emergence of understanding of the quantum theory via his uncertainty principle and Bohr’s complementarity. He scatters it with many, often amusing anecdotes serving to emphasize his considerable insight and feeling for the subject. Dirac concerns himself with detailing his views on the two means of theoretical progress — the removal of inconsistency and the uniting of disjoint theories. He shows how the formulation of the Dirac equation falls into the first class.

These three lectures make absorbing reading by being simultaneously informative and entertaining. While certainly accessible to a non-specialist audience, this is a book of true value to the working theorist, a nugget of inspiration. And obviously, if one wishes for advice on the scientific method, these are three people to whom great attention must be paid. — ANDREW R. LIDDLE.


This book is one in the series of Readings from Scientific American, which should at once give some idea of the level at which the material is pitched, and the style of the presentation. As for the contents, the title is slightly misleading; ‘Galaxies’ primarily means our Galaxy, represented by essays on ‘The Central Parsec’, ‘Globular Clusters’, ‘Molecular Clouds’, and ‘Coronas’ (although these topics are, in some places, put in the context of other systems). The remaining sections are on ‘Luminous Stars’ (ε Aurigae and R136), ‘Supernovas and Remnants’ (four essays, including one on millisecond pulsars), and ‘Pioneers’ — articles on William Herschel and H. N. Russell, which are entertaining enough, but which seemed to me to be rather out of place in this collection.

Individually, the essays make interesting reading, as one would expect. However, going through the book, I longed for more obvious evidence of

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