further states, correctly, that information about distant events can be obtained only through electromagnetic signals, but he implies that this always involves observations of time.

It is implied that we know the distance of planets, stars and galaxies from the time it takes for light from them to reach us. In fact, we can determine this time only in the case of the Moon, where a reflector has been placed to get light signals there and back. For more distant objects we have to use the ancient method of triangulation, which cannot be carried out with the same incredible accuracy as frequency measurements. And in the course of a rather obscure discussion of chaotic systems, the author claims that the soluble equation $dx/dt = ax(1-bx)$ leads to chaotic behavior.

In spite of the many surprising errors, *The Observational Foundations of Physics* presents an interesting challenge, and experienced readers will be stimulated to decide whether to accept the author's picture or to create their own. Here, as elsewhere in science, it is often more important to ask the right questions than to put forward answers.

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Lectures in Particle Physics

Dan Green
World Scientific, River Edge, N.J. 1994. 475 pp. $48.00 pb
ISBN 981-02-1683-1

Richard P. Feynman begins his book *Theory of Fundamental Processes* with the statement "These lectures will cover all of Physics." In his book *Lectures in Particle Physics*, Dan Green has attempted the more modest task of providing the student of particle physics with the basic information on this field. Each of the book's four sections is derived from a series of lectures on specific topics in particle physics. Green indicates in his preface that his original intent was to explain the entries in the "particle data book," which he claims summarizes the accumulated wisdom of our field. This material constitutes the book's first section. The second and third sections introduce two particular issues at the frontiers of particle physics: *CP* violation in B physics and the explorations inherent in collider physics at the highest mass scales. Lastly, Green points out in the preface that particle physics has recently allied itself with cosmology in the exploration of the origins of the universe, and therefore some knowledge of general relativity is necessary for a well-rounded education; this material constitutes the fourth section of this book.

Unfortunately, it is not really clear for whom this book is intended. The list of four topics is too disjointed, and each topic too narrowly focused, to provide the student in an introductory course with a broad overview of particle physics. On the other hand, each section is sufficiently short that the expert would most likely not turn to this book as a reference.

Despite the absence of an obvious clientele, *Lectures in Particle Physics* has a number of positive features that would make it most suitable as a supplemental text in an introductory (or even advanced) course in particle physics. For example, the development of the constituent quark model in the first section is clear and concise, and all the ingredients that contribute to the construction of an effective quark and gluon potential are well motivated by physical considerations. Inevitably, such a topical approach slights some important subjects. The OZI (Okubo–Zweig–Iizuki) rule is mentioned, but just barely, and there is little on the QCD prediction of gluonic bound states, or glueballs. In fact, there is surprisingly little on quantum chromodynamics and strong interactions in general. The processes of quark and gluon fragmentation and hadronization, which are essential for understanding jets in e^+e^- collisions—at the Z^0 resonance with the CERN LEP collider and the SLAC linear collider, for example—and jets in hadronic collisions—at the Fermilab $\bar{p}p$ collider—are dealt with only minimally.

The section on B physics includes an excellent summary of both the origin and present knowledge of the CKM (Cabibbo–Kobayashi–Maskawa) matrix. This is a field in which recent progress has been great, and some of the quoted experimental results have been superceded by more precise measurements.

Another feature of this book, which again makes it suitable only as a supplemental text for a course in particle physics, is the complete absence of problems or exercises. It may be possible for some people to learn particle physics solely by reading a text and not actively solving problems themselves, but those people are surely a small minority of physics students.

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