all things in so short a book, Rohrlich has produced a text that can help redress a serious problem in the present educational system in the US. It is a response to the science illiteracy that is rampant even among so-called educated Americans. His goal is a worthy one, and this vehicle could be effective in many courses for nonscience students. It is true that we must educate the students we actually get. Still, what is sad—and this is *no* detraction from Rohrlich's book—is that we must now assume (and demand) so little from *college* students! In a way, such an undemanding approach sidesteps the basic malaise. We must demand more of students, not cater to their weaknesses in mathematics and science.

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Rochester Roundabout: The Story of High Energy Physics

John Polkinghorne
Freeman, New York, 1989. 204 pp. $24.95 hc ISBN 0-7167-2080-9

John Polkinghorne, ordained priest of the Church of England and sometime Cambridge academic, has written a short, informal memoir of 30 years of Rochester Conferences. These initially small, annual gatherings, the brainchild of Robert E. Marshak, began in late 1950 in Rochester, New York, five years before Polkinghorne received his PhD in theoretical physics under Abdus Salam. By the time the author's account ends (effectively in 1980 when he ceased full-time involvement in particle physics to pursue a career as a man of the cloth), the meetings had evolved with the field of high-energy physics into large, formal, biennial international conferences with up to 1000 participants.

Polkinghorne's account, laced with a dozen and a half apt photographs, permits the veterans to indulge in a nostalgia trip, delighting in shared memories of people and controversies, pouting at ignored or slighted topics, or feeling superior at identifying the unidentified in photographs (Jack Leitner with Murray Gell-Mann on page 105). On the down side, one might wish that the author had suppressed the irrelevancies and cuteness, and had been more careful about names, technical facts and some of his generalities.

Inevitably, as is freely acknowledged by the author, the subjects in which he was personally involved or interested get the largest share of the discussion. Analytic properties of the S-matrix and Regge poles loom large, but in fact they did loom large during the period covered in the middle of the book. The author is fair in his judgment, granting that the achievements of "nuclear democracy" were less than promised, with field theories, particularly gauge field theories of quarks and leptons, central to high-energy physics by 1980.

What is in this book for those under 40, who know the Conferences only as gigantic assemblies of strangers, no longer held in Rochester or even bearing that name? (As James Thurber might say, What is the Rochester Conference doing in Singapore?) First of all, it is an eyewitness account of an exciting time—perhaps the most exciting time—in particle physics. The account starts with pion–nucleon interactions and the (3,3) resonance, strange particles and the τ–θ puzzle; moves into the wonderful discoveries of parity nonconservation and the $V-A$ theory of weak interactions; proceeds to the myriad hadronic resonances, SU(3) symmetry and Regge high-energy behavior; goes on to quarks, CP violation, deep inelastic scattering and electroweak unification; then to the November 1974 revolution, QCD and finally to the W and Z gauge bosons. This jaunty account of the regular "Rochester" gatherings illuminates with personal vignettes the more detailed pedagogical story of particle physics told in such books as Robert Cahn and Gerson Goldhaber's *Experimental Foundations of Particle Physics* (Cambridge U. P., New York, 1988, reviewed in PHYSICS TODAY, April, page 76). Old timers will argue whether the true story has been told in some instances, but all will catch the flavor of intimacy in the early conferences, with the patriarchs and brash youngsters making common cause. The reader will have to judge how well the author picks the salient feature from each of the larger, more formal meetings.

For the young and old, the last chapter of the book may prove a surprise. It is perhaps the most important part of the book. Contrary to the expectations of some, this chapter, entitled What Was Happening?, is a patient and persuasive defense of scientific realism as applied to science in general and particle physics in particular. The author believes wholeheartedly in the idea of a convergent realism as the achievement of science. In this scheme successive descriptions have ever greater breadth and precision, but are built on the earlier concepts, extending rather than overthrowing them. To those who argue that advances are matters of consensus, not necessity, he says, "Our tale would then indeed have been one of a roundabout, a ceaseless circling which never got anywhere." (With this statement, should not the title have a question mark?)

Some readers will be bored with this defense, not seeing the point of jousting with philosophers on whether the Standard Model is a product of our culture and sociology or our best attempt so far to describe the real world. What do nonscientists know about it, anyway? However, for the vast majority of physicists, who perhaps have somewhat muddled views about reality and scientific realism, Polkinghorne's discussion provides a succinct summary of an appealing and defensible point of view, not the least bit theological. The Reverend Polkinghorne intrudes only in the final two sentences and in a charming picture, collar and all, on the inside of the dust wrapper.

Particle physicists over 50 will be reminded by this book of the good old days when physics was a calling, not a profession, and they were full of pepper. Lost innocence regained and all that. The book is recommended to beginning physicists for a glimpse at the ebb and flow of progress in the search for an understanding of the basic forces that govern the universe and for freeze-frame sketches of many of the heroes of modern physics. All readers are advised to ignore the distracting footnotes: These are collected chapter by chapter at the end of the book and almost always merely cite pages in ancient Proceedings of the Rochester Conferences that your physics library does not have.

Because this book, though slight and personal, purports to be a bit of history, it is not vindictive to point out a number of errors in the hope that the author and publisher will correct them before reprinting. It is Malvin, not Marvin Ruderman (page 48), Marty Block, not Bloch (page 57 and in the index), Madame, not Mrs. C. S. Wu (Mrs. Luke Yuan) (page 62), Eyvind Wichmann, not Wickman (page 81), Pief, not Peef Panofsky (page 124) and Kiev, 1959, not 1958 (page 130). The National Accelerator Laboratory is west, not south, of Chicago (page 134)—the author is thinking of Argonne National Laboratory—and the caption of the picture on page 51 is incorrect—Pierre Noyes is on Dyson's right; Hans Bethe is nowhere to be seen.

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Introductory Nuclear Physics

Samuel S. M. Wong
Prentice-Hall, New York, 1990. 486 pp. $56.20 hc
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Most physics departments offer general survey courses in nuclear physics for graduate students and/or advanced undergraduates. In the 1960s and '70s, several excellent textbooks were available that were well suited to such courses and were widely used. In more recent years nuclear physics has evolved considerably, partly because of the successful description of hadrons in terms of the quark model. (For example, there is much current activity in studying relativistic collisions of heavy nuclei to explore the possible formation of a quark–gluon plasma.) Accordingly, the classic textbooks are no longer satisfactory for a modern course in nuclear physics, and there has been a growing need for an up-to-date treatment of the subject.

Samuel S. M. Wong's *Introductory Nuclear Physics* fills this need admirably. The basic topics of nuclear physics are presented at just the right level for a one-semester graduate course, and there is an emphasis on current developments throughout the book. For example, on long-studied topics like nucleon–nucleon scattering phase-shift analysis, Wong has tried to provide the latest results whenever possible. He has also written numerous sections on intriguing recent discoveries like the EMC effect (first observed by the European Muon Collaboration), which suggests that nucleon-structure functions may depend on the nuclear environment. Particularly valuable is the selection of homework problems, which are well chosen and instructive. Many of the problems require the calculation of interesting quantities, for example, cross sections and energies. In my opinion, students badly need to perform such exercises. Yet another nice feature of the book is that all equations are ingeniously written so that both the cgs and SI forms are immediately apparent in a single equation.

While the book could be used in principle for an advanced undergraduate course, the author uses quantum theory from the very beginning. It is essential therefore that students should have taken a basic quantum mechanics course.

My main criticism of the book is that it omits any discussion of experimental techniques. Most physics courses tend to emphasize theory, and students are often weak in their