Thomas suffered severely from its premature preparation. Many of the early reports in the field were fragmentary and often incorrect, or at least misleadingly interpreted. By now most errors have been corrected, and aside from the still vexing problem of xenon hexafluoride most of the chemistry falls into a reasonably consistent pattern.

The interest in the field is undoubtedly due to the existence of a conventional chemistry for xenon, but Holloway does not neglect the early history of failure to find reaction and the unusual and short-lived species of reaction products that were studied before it was realized that ordinary fluorides and oxides could be synthesized.

Enough of the experimental techniques and preferred preparative methods are given to enable the newcomer to the field to get started with relatively little waste motion. The theoretical discussion is somewhat simplified and, although this may have been intentional given the expected wide range of readers, I have some reservations as to the precision and adequacy of the treatment. For example, the Gillespie ideas are presented in their simplified form and their inadequacy is correctly demonstrated, without, however, any notice of some of the possible refinements that have been suggested. The more recent attempt by Bartell to rationalize the Gillespie predictions with an equivalent molecular orbital approximation unfortunately appeared too late to be included in the volume.

The book is well illustrated, errors are scarce, and the price is low enough to permit a reasonably wide circulation. Teachers of inorganic chemistry will find many useful illustrations of techniques and problems in the chemistry of the noble-gas compounds, and this volume is a most useful key to the subject.

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Quantum Field Theory

Particles and Fields. DAVID LURIÉ. Interscience (Wiley), New York, 1968. xii + 508 pp., illus. $15.

Quantum field theory has a 40-year history. After a long initial period of a rather primitive theory (by today's standards) it reached unforeseen success after World War II when electromagnetic interactions yielded brilliant agreement with high-precision experiments. But the pride in quantum electrodynamics was short-lived when nonelectromagnetic interactions did not yield to the same techniques. As a result, most theorists turned away from field theory to attempt new and different ways, while a small group turned to mathematics for the answers.

The work of these relatively few theorists was soon dubbed "axiomatic quantum field theory." But the importance of their work lies not in their axioms but in their attempt to bring rigorous mathematics, including the mathematics of the present century, to bear on the problems of field theory. Rigorous field theory, now some 15 years old, has produced a large number of fundamental results. Based on these, our present knowledge of quantum field theory is so far advanced over the theory of the early 1950's that today we can rightly call that theory "naive."

It is a little surprising, therefore, that none of this advancement can be found in *Particles and Fields*. What one does find, however, is a fine account of *naive* quantum field theory (chapters 1 through 6) and its developments since the early 1950's (chapters 7 through 10). The book serves thereby a very useful purpose for those who are interested in fundamental questions: it shows how the heuristic use of mathematics in field theory leads to many contradictions and inconsistencies; how a theorem proven heuristically (p. 317) is found to be invalid (6 pages later) when bound states are present; how the Yang-Feldman equation derived in perturbation expansion differs from the nonperturbative results, and so on. Thus this textbook shows to every serious student of theoretical physics the need for a rigorous approach. In this respect alone it teaches a great deal.

At the same time, *Particles and Fields* provides many important computational methods which are the basis of much of the phenomenological theory in present-day particle physics. There is an excellent chapter on currents, coupling constants, and sum rules which includes the Goldberger-Treiman relation and a treatment of the important papers by Fubini and Furlan, by Adler, and by Weisberger. Dispersion-relation techniques are not included. There are few books in which the Bethe-Salpeter equation is treated in as much detail as in this one. Of course, this is also where the author can draw heavily on his own research work. The chapter on the functional method is strongly influenced by its heuristic development; some statements that cannot stand up under rigorous scrutiny should therefore not be surprising. Highlights of the first six chapters include explicit applications to spins 1 and 3/2 of the Bargmann-Wigner equation, an introduction to internal symmetries, and a lucid explanation of renormalization by means of the chain approximation.

As a textbook, *Particles and Fields* is quite readable and is provided with problems at the end of each chapter which supplement the text and furnish omitted proofs. The prerequisite is at least two semesters of graduate quantum mechanics. The book is printed well and contains a good index, as well as references at the end of each chapter. There is little doubt that *Particles and Fields* will be used widely as a first course of quantum field theory. And there is also little doubt that the thoughtful students will want to go beyond this book to a more rigorous treatment.

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Archeological Research

New Perspectives in Archeology. SALLY R. BINFORD and LEWIS R. BINFORD, Eds. Aldine, Chicago, 1968. x + 374 pp., illus. $9.75.

This volume is composed of 16 articles, plus critiques by six discussants and three very short introductory pieces by the editors. Most of the papers were presented, in their original form, "at an all-day symposium entitled 'The Social Organization of Prehistoric Communities' held at the 64th Annual Meeting of the American Anthropological Association at Denver in November, 1965." For publication, however, many of the original papers have been substantially revised, and five additional ones have been included.

On the whole, this is a provocative and stimulating collection and a significant one. Although individually of rather uneven quality, the articles taken en masse present an overview of current archeological interests among the younger archeologists which is remarkably consistent and develops quite an impact. The mere breadth of temporal and areal coverage is exciting: from the Middle Paleolithic to recent Apache and