overdue. But if, as Lewis Binford says, "archeology in the 1960's is at a major point of evolutionary change," it is because at long last action is catching up with idea, performance with old perspective.

This volume is an outrageously sloppy job of typesetting or proofreading. The typos, transposed lines, and faulty references are entirely too numerous for a publication that is intended to be taken seriously as a scholarly production.

WALTER W. TAYLOR
Department of Anthropology, Southern Illinois University, Carbondale

Commutators and Currents

Current Algebras and Their Application. B. RENNER. Pergamon, New York, 1968. xiv + 177 pp., illus. $9. International Series of Monographs in Natural Philosophy, vol. 12.

Current Algebras and Applications to Particle Physics. STEPHEN L. ADLER and ROGER F. DASHEN. Benjamin, New York, 1968. xiv + 394 pp., illus. Cloth, $12.50; paper, $5.95. Frontiers in Physics.

Certain algebraic properties of quantum field theory—the equal-times commutators of currents and densities—are essentially independent of the detailed structure of strong interactions. Murray Gell-Mann, in 1961, first suggested that these properties could "lead to exact sum rules for the weak and electromagnetic matrix elements [from which] we can in principle determine constants like $-G_A/G_V$." Four years later, this challenge was met by two physicists, whose classic evaluation of $-G_A/G_V$ in terms of observed scattering cross sections is known as the "Adler-Weisberger relation." Their success led to a surge of interest in the field of current algebra, with an enormous volume of work published (much of which should not have been) and with the discovery of several other important and experimentally correct relations (principally: the prediction of s-wave π-nucleon scattering lengths, connections among K-meson decay modes, and a formula involving nucleon form factors and photoproduction cross sections).

Each of the books under review provides a guide to this literature and a summary of these developments. Published at the same time with almost identical titles, written by active young current-algebraists, and aimed at students or scientists with a sense of relativistic quantum mechanics, these two books are very, very different.

Renner, seeking completeness, gives a list of 547 references and an apology "to all authors who find some of their contributions not listed." His book is an uncritical compendium of every article written about current algebra from 1965 to 1967, right or wrong: perhaps it is the world's longest scientific abstract. On the other hand, Adler and Dashen give us 22 selected reprints with a running commentary that attempts, rather successfully, to tell a coherent story. Here there is no claim of completeness.

As a guide to the literature, Renner's book succeeds: it is the surest and quickest way to find out who did what when in current algebra; but it would have been even more useful had Renner separated the enduring contributions from the more numerous duds. It is not a good book from which to learn current algebra. At the more exciting and pedagogically important points, the author inevitably begs off with words like "this discussion is beyond the scope of the book." Also, the book abounds in misleading statements and half-truths: to say "in the SU(3) symmetric model there would be no problem in determining [the Cabibbo angle]" (p. 14) is wrong, for in this model the angle is empirically indefinable; or, to conclude that current algebra explains the observed suppression (by a factor of 500) of K^+ decay (p. 101) is unwarranted because of the drastic (good to 20 percent, at best) approximation involved. If the reader tolerates such statements, he will find a brief and comprehensive review of the heroic years of current algebra.

Adler and Dashen's book is more than twice as thick as Renner's, but it covers much less ground. No SU(6), no quark model—only the rock-solid achievements of current algebra (excepting, perhaps, the last two, more speculative and hence more dated, chapters). Each chapter consists of some text and several reprints more or less integrated with the text. The articles are well picked and themselves make the book valuable. Much of the text, like the section called Physics of the Infinite Momentum Limit, say well things that are just not said elsewhere. Occasionally, as in the discussion of the Cabibbo current, or in the demonstration that "the divergence of the 'seagull' cancels the Schwinger term" (p. 221), one could have wanted more elegance and less explicit calculation. But, for the nonspecialist reader, it could also be argued that to be explicit is to be understood. Fortunately, the heart of this book—chapter 2, "Low energy theorems for pions," and chapter 4, "Sum rules"—is both elegant and explicit.

An eclectic book incurs errors of omission. Most serious, for the book of Adler and Dashen, seems the lack of mention of the significant work of Schwinger, Bell, and Veltman on the relation between current algebra and the equations of motion of the underlying fields. Nevertheless, this is the book I recommend to my students, and I have even spied it on the shelves of my experimentalist colleagues.

S. L. GLASHOW
Lyman Laboratory of Physics, Harvard University, Cambridge, Massachusetts

Applied Optics

Gas Lasers. ARNOLD L. BLOOM. Wiley, New York, 1968. xii + 712 pp., illus. $8.50. University of California Letters and Science Extension series; Wiley Series in Pure and Applied Optics.

Generally this is a worthwhile book offering at least some information, new and able to be grasped, to readers over a broad range of prior competence. On the other hand, topics discussed range from the trivial to ones that clearly are beyond the scope of the work (such as Lamb's theory). Discussions of difficult topics are generally incomplete, and few readers will be able to read through directly without getting stuck somewhere, unless they are already informed on these topics. There is still some utility in such difficult theories' being mentioned, by way of setting them in their place in the order of things. But the author's choice of theories to be discussed in detail is not perfectly consistent. (The Bloch equations are presented, without development, and used for discussion.) Here and otherwise the book bears the stamp of the author's own interests more than it should.

Chapter 1, "Basic principles," has the usual weakness, diffuseness, of introductory material. There are a number of inaccuracies and small points of irritation. (i) This reviewer recalls there being shown at a meeting of the American Physical Society a slide pho-