one senses in Dockstader's remarks an implication that "true" anthropological endeavor in museum settings has been subverted by the insidious forces of social science as localized in universities. Perhaps, however, museums should put their own houses in order and reassess their own failings before attributing their loss of centrality in the anthropological establishment to outside forces. Statements such as "a student who studies anthropology without access to material culture is like a chemistry student who has never been in a laboratory" are not apt to gain Dockstader many converts.

RAYMOND D. FOGELSON
Department of Anthropology,
University of Chicago,
Chicago, Illinois

Lectures by Scientists

Science in Progress. Sixteenth Series. WALLACE R. BRODE, Ed. Yale University Press, New Haven, Conn., 1967. xiv + 390 pp., illus. $10. Sigma Xi National Lectures, 1964–1966.

In a brief preface the editor announces the decision of the executive committee of Sigma Xi to discontinue publication of this series, a step that has long seemed overdue. In spite of the fact that all the articles in each volume have been outstanding, the volumes have lacked unity and purpose as books, and since the lecturers are conspicuous contributors to their fields of research, the material they present in their Sigma Xi lectures has as a rule already been published elsewhere. The decision to discontinue publication serves, however, to single out the present volume as the swan song of the series, and it acquits itself nobly of this distinction.

Of vital interest to all scientists regardless of specialization are the articles by J. Bronowski and René Dubos. Bronowski's essay on the limitations of logic and the nature of the mind is even more keenly challenging than his *The Identity of Man,* upon which it is largely based. The essay by Dubos, though addressed directly to biologists, is fully its equal in incisiveness and depth. Together the two essays hold up a mirror to man in which he may see himself better as he seeks to understand his own quest for knowledge of the external environment and himself. Both essays deal essentially with human biology—or specifically, with the nature of that aspect of the human organism's behavior which we call mental. In the field of straightforward biology, Norman H. Cromwell's article on carcinogenesis, Ernest C. Pollard's on genic action in plants, and Talbot H. Waterman's sophisticated discussion of orientational aspects of visual interactions in invertebrates constitute as good a segment of the advancing front of modern biology as one could hope to find.

The same excellence obtains, of course, in the sampling of the physical sciences and technology, though the items presented comprise a far smaller and hence less dramatic and less representative selection of the period's lectures. The essays offered consist of Lyle B. Borst's review of the unique properties of liquid helium, C. J. Phillips' exhaustive discussion of brittle materials, and C. M. Sliepcevich's account of the history and potential uses of liquefied natural gas. The lone venture into psychology or something akin to it by Alphonse Chapanis merely serves to add diversity.

Of general interest also are the opening essay by Hugh Taylor and the closing one by W. H. Pickering. Both are addresses delivered when their authors were awarded Procter Prizes, in 1964 and 1965, respectively. Taylor's essay is packed with valuable information on the wonderful cooperation between industry and free scientific research that a democratic or nontotalitarian society is capable of. Pickering gives an equally rich and lucid account of cooperation between government, engineering, and research in carrying out the space program in the United States. Clearly, this volume is one which any library of science would much benefit in having.

MARK GRAUBARD
Natural Science Program,
University of Minnesota, Minneapolis

Chemical Physics

Intermolecular Forces. JOSEPH O. HIRSCHFELDER, Ed. Interscience (Wiley), New York, 1967. xii + 643 pp., illus. $22.50. Advances in Chemical Physics, vol. 12.

Recent advances in both experimental methods and theory related to intermolecular forces are excellently presented in this volume to readers already generally familiar with the subject. This is not an introduction; it is addressed to those who have command of the fundamental theory and older experiments but have not kept up with the journal articles in the last few years. As in any volume made up of contributed chapters, the quality is uneven and there is some overlap.

Particularly masterly is the chapter by Hirschfelder and Meath on the quantum theory of intermolecular forces, in which particular attention is given to very simple cases such as two hydrogen atoms. For a time it was thought that dispersion (or London) forces could be treated as additive pairwise even in dense gases, liquids, or solids; but it is now realized that three-body interactions are significant, and Sinanoglu presents an excellent summary of this theory and its application in condensed states. On the experimental side, molecular beam experiments have been very fruitful, and these are reviewed by Bernstein and Muckerman. In all there are six chapters on theory and four on experimental methods, and each is important for some aspect of this subject. This volume is a valuable addition to the literature on chemical physics.

KENNETH S. PITZER
Rice University, Houston, Texas

The Sun

Solar Activity. EINAR TANDBERG-HANSSEN. Blaisdell (Ginn), Waltham, Mass., 1967. xvi + 464 pp., illus. $16.50. Pure and Applied Sciences series.

Solar activity in general concerns the sun's outer layers, the photosphere, chromosphere, and corona, where magnetic fields undoubtedly play a vital role in most of the observed phenomena. The sources of these fields may well lie deep within the sun, but their influences extend to the orbit of the earth and beyond. As the nearest star, the sun should be an example for astronomers of how complicated things can be nearby that seem straightforward from afar. This book illustrates the point effectively.

Tandberg-Hanssen advocates application of the physics of plasmas to solar problems. A little like being for mother, country, and God! Everyone can praise these objectives. The book organizes itself from the point of view of the solar atmosphere as a natural example of a multicomponent, magnetic plasma. The problems that present themselves, difficult physically, and horrible analytically, are nevertheless the obstacles in the path of deductive solar physics. Progress has been slow and therefore welcome even in tiny

steps from wherever: traditional theoretical analysis, sophisticated phenomenology, or some combination of the two, or intuition if it can be fruitful.

This book is on the right track, but carries us only a very little way forward. Written for professional solar astronomers or advanced graduate students, it relies very heavily (by rough analysis as much as 50 percent of the total contents) on close paraphrasing of published articles. This is particularly true with respect to theoretical developments. However, the serious student of solar astronomy will have to refer to the original papers themselves, since some of the omitted portions of published articles represent the heart of the matter. The author provides virtually no criticism or analytical insights to make understanding easier, or to relate developments from various points of view. The value of this tabulation lies in the author's choices, involving his judgment. Most professionals will prefer to substitute their own. As uncritical précis, the book has merits, but one might hope for more from its laudable objectives.

The book closes with the paradoxical remark that "while a comprehensive picture . . . is slowly emerging . . . much . . . remains to be done." You can read that two ways. I am not, on the whole, as optimistic about the present accomplishments of solar astronomy. Instead, major qualitative insights still remain to be found by people with wits and knowledge. They may be discouraged by parts of this book.

Most professionals, and libraries, will wish to have it. Proceed with caution in using it, however; as a tutorial handbook it is weak; as a guide to some, though not all, of the literature it is probably useful.

JAMES W. WARWICK
Department of Astro-Geophysics, University of Colorado, Boulder

Physics Series

Advances in Nuclear Physics. Vol. 1. MICHEL BARANGER and ERICH VOGT, Eds. Plenum, New York, 1968. xiv + 416 pp., illus. $18.50.

Whatever our regrets, modern physics has clearly become fragmented into subfields that have little overlap. One well-defined subfield is nuclear physics, which occupies "a central position between elementary particle physics on one side and atomic and solid state physics on the other." Therefore it is fitting that there appears a new series of review volumes devoted exclusively to topics in nuclear physics. The editors of this series are known for the clarity and completeness of their own research contributions. Their aim is to secure articles that present up-to-date pedagogic treatments of topics in the current research literature. It may be that soon the best way to enter research in some area of nuclear physics will be to study the pertinent articles of this series.

The five articles of volume 1 bear out this expectation. DeBoer and Eichler give a definitive study of the reorientation effect, an effect that allows the measurement of quadrupole moments of excited states. Starting with a qualitative introduction to the theory of Coulomb excitation, the article moves along smoothly to procedures for the practical design of reorientation experiments. Malcolm Harvey summarizes the content and status of the SU_3 submodel of the nuclear shell model. Although his subject is inherently somewhat dry, the article seems extremely thorough and clear. A series of nine appendices form a précis of relevant topics in group theory. Georges Ripka summarizes the Hartree-Fock theory of deformed light nuclei. In this theory the configuration mixing caused by the two-nucleon interaction is approximated by using single-particle states generated by a deformed single-particle potential. Despite a resemblance to the Nilsson theory, the Hartree-Fock theory leads to qualitatively different results. The article starts from first principles and proceeds with clarity toward its goal of enabling the reader to perform his own calculations. The juxtaposition with Harvey's article is helpful, because the SU_3 theory and the deformed Hartree-Fock theory yield related reductions of the nuclear shell model. A valuable article by Vogt presents the modern form of the statistical theory of nuclear reactions. This simple theory gives accurate accounts of most of the flux that enters low-energy nuclear reactions. Heretofore it was necessary to consult the research literature to learn how the old theory of Wolfenstein and Hauser-Feshbach had been improved. The article includes worked-out examples. Ian Duck treats the much-discussed nonrelativistic three-nucleon system. It is odd that the author stresses Amado's contributions but in the concluding section remarks (correctly) that Mitra's work on the same problem handles the physics more completely. Mitra's work is not presented.

N. AUSTERN
Department of Physics, University of Pittsburgh, Pittsburgh, Pennsylvania

Social Class and Psychiatric Care

A Decade Later. A Follow-up of *Social Class and Mental Illness.* JEROME K. MYERS and LEE L. BEAN, in collaboration with MAX P. PEPPER. Wiley, New York, 1968. xiv + 250 pp. $7.95.

Ten years ago, research reported in *Social Class and Mental Illness* added further empirical documentation to an already fairly well-established fact: that the lowest socioeconomic class in the society is greatly overrepresented among clients of psychiatric treatment facilities. A. B. Hollingshead and F. C. Redlich, the sociologist and psychiatrist who authored that report, focused on two related but distinct questions: First, is the risk of developing a psychiatric disorder a function of social position? Second, are there class differentials in the quality and type of psychiatric treatment received? Because of the inherent difficulty of disentangling causal relations in a cross-sectional study of a population that was already in treatment, the answer the study gave to the first question was suggestive but equivocal.

Over the past decade, work of increasing sophistication has begun to throw more light on such components of the problem as class of origin, social mobility, educational and occupational achievement, the course of illness, and the paths into and out of treatment. The answer to the second question, on the other hand, was clear and definite. Lower-class patients received less-preferred treatments—custodial care in state hospitals rather than intensive treatment in private hospitals or outpatient clinics, drugs and other somatic treatments rather than psychotherapy. In short, patterns of class discrimination evident in other sectors of the society were also present in the psychiatric treatment of mental illness. This was hardly a startling finding, certainly not to the members of these classes,