ideological position quite opposed to Skinner's behaviorism. How does Skinner now regard Boring? He does not tell us explicitly, but he does let slip at one point that Boring's lecture notes were 25 years old; at another point he quotes an early letter in which he had described Boring as a stupid son of a bitch.

There is, indeed, room at the top. In the second volume Skinner, who is a skillful writer, evidently wants us to see how he got there.

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Solid State Systems

Highly Conducting One-Dimensional Solids. JOZEF T. DEVREESE, ROGER P. EVRARD, and VICTOR E. VAN DOREN, Eds. Plenum, New York, 1979. xiv, 422 pp., illus. $42.50. Physics of Solids and Liquids.

Solid state physics in one dimension has received an enormous amount of experimental and theoretical attention since the synthesis, in the early 1960's, of highly conducting complexes of the organic acceptor molecule TCNQ (tetracyanoquinodimethane) and since the rediscovery, at roughly the same time, of "platinum-chain salts" exemplified by KCP (potassium tetracyanoplatinate). This volume, a compendium of eight chapters by 11 authors, serves as a comprehensive review of the field up to the early part of 1978. Unlike several previously published conference proceedings that it will undoubtedly replace as a convenient reference, *Highly Conducting One-Dimensional Solids* has been planned and prepared in such a way as to give the reader a relatively concise yet comprehensive and balanced perspective of the successes and remaining controversies in the field. The authors, all of whom have worked extensively in one dimension, review in particular detail the experimental work that was performed after 1973 on the organic charge transfer conductor TTF-TCNQ (tetrathiofulvalene-tetracyanoquinodimethane) and its alloys and summarize the concurrent theory that was engendered. The coverage therefore includes the enormous bulge in publication of papers between 1973 and 1976, and the book should prove useful as a reference for workers already in the field, as an introduction for newcomers, and as an informative browse for the casually curious.

TTF-TCNQ first hit the headlines in 1973 when A. J. Heeger and A. F. Garito announced during a meeting of the American Physical Society the discovery, at the University of Pennsylvania, of a huge increase in its conductivity near 60 K. This observation, coupled with the high degree of electrical anisotropy in the material, stimulated feverish activity around the world from California east to Japan and spawned many controversies, some of which are not yet settled. Considerable advances in our understanding of the effects of electron-electron and electron-phonon interactions have been made as a result of the opportunity to apply mathematically tractable one-dimensional models to real materials. Much of this theoretical work on the one-dimensional electron gas is covered in the chapter by Emery, which will serve as an excellent survey for the many-body theorist. Emery also points out the connection between the various exact and approximate solutions and problems in other fields of physics, such as the two-dimensional Coulomb gas and the roughening transition of solid surfaces.

The juxtaposition of the chapters by Heeger and by Schultz and Craven emphasizes a major remaining subject of controversy, namely the role of a collective mode in the electrical conductivity. Heeger lays out the growing body of evidence in favor of such a mechanism, describing the results of many experiments on the electrical, optical, magnetic, and structural properties of TTF-TCNQ. Schultz and Craven take the view that no single model adequately explains the accumulated data. Another controversy, touched on only briefly in the book, concerns the magnitude and importance of the electron-electron interaction compared to the electron-phonon interaction. I would have preferred to see a more extensive discussion of this problem.

The holy grail of this field of study remains the synthesis of a high-temperature superconductor, perhaps employing the excitonic coupling mechanism proposed by Little in 1964 and reviewed in the present volume by Gutfreund and Little. The quest goes on, perhaps in vain, but like the knights of the Arthurian legend (the comparison should not, however, be pushed too far) the scientists involved have achieved much along the way. *Highly Conducting One-Dimensional Solids* is not the final word on the subject by any means, but rather appears as a timely guide to a field of research that is rapidly becoming more diversified. Many important one-dimensional materials, such as the incommensurate-chain compound mercury arsenic hexafluoride and the highly conducting derivatives of polyacetylene, are too recently investigated to be included. Omitted also is a great deal of important work on other charge-transfer organic complexes and the recent and continuing studies of TTF-TCNQ, notably the high-pressure investigations of Jerome and co-workers, which may furnish the conclusive evidence in favor of collective conductivity.

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Earth Tides and Ocean Tides

Tidal Friction and the Earth's Rotation. Proceedings of a workshop, Bielefeld, Germany, Sept. 1977. P. BROSCHE and J. SÜNDERMANN, Eds. Springer-Verlag, New York, 1978. viii, 242 pp., illus. Paper, $24.

This is an attractive, concise, and remarkably comprehensive treatment of one of the most fascinating and interdisciplinary fields of earth science. To understand the rotation of the earth and the history of the lunar orbit we must delve into history, astronomy, geophysics, geology, paleontology, hydrodynamics, and meteorology. In perhaps no other field is input required from such a variety of disciplines. Relevant subjects include laser techniques for measuring the earth-moon distance, radio astronomy techniques for measuring current changes in rotation rate, ancient solar eclipses, Mercury transits, lunar occultations, and growth periodicities in fossils. The timing and location of ancient eclipses require training quite different from that of the modern astronomer. It is remarkable that in such a small volume most significant aspects of the subject have been dealt with in adequate detail to satisfy both the beginner and the specialist.

The book covers astronomical observations from pretelescopic times to the present. Solid-earth and ocean tides are discussed from several points of view, including their interactions. One of the more intriguing chapters is an attempt by Sündermann and Brosche to calculate tidal friction for ancient oceans. Most of the present tidal dissipation occurs in shallow seas, and changes in the configuration of the continents and in sea level can be expected to change the tidal friction and hence to change the lunar orbit. If such changes did not occur, the moon