fact mainly consists of a number of quite comprehensive, well-documented reviews (the discussion, incidentally, is presented in narrative form). Perhaps the reader, having more time than was available to the participants at the meeting, will be in a better position to mull over and derive inspiration from the mass of detail that is presented.

While proving invaluable to the clinician interested in all aspects of the biology of the placenta, the book, then, also has much to offer the basic research worker who wishes to broaden his or her outlook. It is divided into four sections. The first, on biochemistry, contains a general review of metabolic pathways and their regulation followed by other reviews relating to the placenta, including an up-to-date account of its endocrine functions by Dorothy B. Villee. The second section, headed Cell Replication, includes papers on the development of the placenta and on the biology of the cancer cell. A paper on trophoblastic neoplasia includes a full account of the earlier cytogenetic studies but does not mention the recent evidence (published in 1977) for the androgenetic origin of hydatidiform moles. The remaining two sections deal with immunology and aging, respectively, and include commendable contributions from W. D. Billington ("The placenta and the tumour: variations on an immunological enigma") and Harold Fox (on the placenta as a model for organ aging).

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Astronomical Phenomena

Active Galactic Nuclei. Papers from a NATO Advanced Study Institute, Cambridge, England, Aug. 1977. C. HAZARD and S. MITTON, Eds. Cambridge University Press, New York, 1979. viii, 318 pp., illus. $32.50. Cambridge Astrophysics Series.

Stimulated by the discovery of quasars in the 1960's and by rapidly accumulating, multifaceted observational data, research on the subject of active galactic nuclei has become one of the most exciting and vigorous fields of modern astrophysics. It encompasses such phenomena as the quasars, Seyfert nuclei, BL Lacertae objects, and powerful radio or x-ray emitters. If quasars are at their cosmological redshift distances, they must be capable of prodigious outputs of energy (of order 10^{47} erg sec^{-1}) from regions of space light-months across. The other sources named above are also extremely energetic, and they appear to be associated with the nuclei of galaxies of stars. Because of various spectroscopic resemblances, many astronomers believe quasars also lie in the centers of galaxies at earlier epochs in the universe.

As yet, no completely satisfactory theoretical explanations have emerged to account for the energetics of active galactic nuclei. It is generally (though not unanimously) agreed that some form of gravitational accretion involving massive black holes must be responsible, but the details of the accretion process and the source of accreting material are still open to speculation. Also, the conversion of gravitational energy into observed continuous or emission-line radiation and the resulting implications for the physical and dynamical gas conditions are not satisfactorily understood.

These are some of the issues that led to the convocation of a NATO Advanced Study Institute in August 1977. The volume reviewed here contains keynote lectures presented at that institute. Two speakers' rules are in evidence: discussion of the local versus cosmological redshift controversy is kept to a minimum and observational data are examined only as they facilitate the discussion of theoretical implications for classes of objects. The presentations may be divided into two groups. Papers in the first group (by Hazard, Osterbrock, Baldwin, McKee, O'Dell, Weedman, Netzer, Perry, and Wolfe) are primarily of a review nature and summarize and interpret existing observational data, including radio, infrared, optical, ultraviolet, and x-ray continuous radiation as well as emission and absorption features. The theoretical interpretations concern the physical conditions in, processes taking place in, and location of the emitting or absorbing gas. In the opinion of this reviewer, these papers constitute one of the best and most comprehensive compilations available on the subject.

The second group of papers concentrates on theories of accretion and energy release for massive black holes in the nuclei of galaxies. Being relatively unfamiliar with this aspect of the research, I especially appreciated Carter's introductory overview. In simple, clear terms he reviews the basic principles of black holes, puts them into perspective with other types of astronomical phenomena, and discusses their possibilities and limitations as power sources in galactic nuclei. The other papers in this group are by Gunn, McCray, Blandford, and Mestel.

The book does not solve the mysteries of the quasars; that was not the intent. What it does accomplish, admirably, is the presentation of available information and current theoretical views regarding the environments and energy sources of active galactic nuclei. Though there have been some new and exciting developments since 1977 (for instance, suggestions that intrinsic quasar radiation is significantly altered by dust extinction, satellite x-ray and γ-ray observations, and a novel idea about the production of FeII emission), the value of the book is not significantly diminished. I highly recommend it for persons working in the field or for persons with a sound background in astronomy or physics who are looking for an excellent introduction to the subject.

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Crystalline Solids

Disorder in Crystals. N. G. PARSONAGE and L. A. K. STAVELEY. Clarendon (Oxford University Press), New York, 1978. xxviii, 926 pp., illus. $69. The International Series of Monographs on Chemistry.

Disorder in Crystals deals with an extremely interesting and broad subject in solid state physics. Though the authors explicitly exclude nonstoichiometric systems and systems with lattice defects, the book includes topics as divergent as molecular crystals (both ionic and van der Waals), inclusion compounds, alloys, superionic conductors, ferroelectricity, and magnetism. This is done in order to show that crystals with positional, orientational, or magnetic disorder—or perhaps a combination of these—have numerous aspects in common. In the past few years several reviews have been published on one or another of these topics, yet nobody has attempted such an extended presentation. One of the successes of the book is certainly that it tells a reader who is familiar with, say, disorder in ionic conductors that it is similar to disorder phenomena in other crystals.

Parsonage and Staveley claim that a look at magnetic systems, which have been most thoroughly studied in the past, may be particularly helpful in revealing similarities with other disordered systems. This is undoubtedly true, and the study of magnetic systems has turned out to be a mainspring in the study of many disorder problems in the last few years. A second main line of the book is the idea that disordered phases can only be understood if they are contrasted with