in the field, four deal directly with the plasma physics of the early solar nebula, and with the interaction between plasma and solid particles. Indeed, an important theme (or more properly, a much-debated question) running through the symposium was the importance of plasma processes for condensation in the early solar nebula. Must one, as Alfvén and Arrhenius argue, treat the nebula as a plasma (albeit with low ionization)? Or may one treat it as an essentially neutral gas, as Anders argues? The issue is not settled. One thing that makes the book valuable is that both views are represented not only in fine, comprehensive papers but also in relatively lengthy discussions between the proponents. As those of us who have attended many symposia know, one often learns more in informal conversation than from the lectures themselves; in *From Plasma to Planet*, some of those helpful conversations are recorded. In these discussions one can detect a growing impatience on the part of a number of participants, as the conference progressed, with Alfvén's frequently expressed view that one should work back from the present state of the solar system rather than attempt to determine the consequences of various assumptions concerning early conditions. Many of the participants felt that both approaches are valuable and that our imperfect knowledge of the solid state and other necessary branches of physics and of the interiors of the planets makes working back from the present state less direct than it might seem.

A fine feature of the proceedings is the emphasis put on observational and even laboratory work. This ranges from discussions of fossil cosmic ray tracks in meteorites to descriptions of past and future space missions by the Soviet Union and the United States. The Soviet Union was represented by G. I. Petrov; the United States by Homer Newell. The former reported on the roving automatic laboratory (Lunokhod) missions, the latter on projected U.S. space shots including "Grand Tour" (major-planet) and cometary missions.

The volume contains a number of good articles which, even if they were without any specific reference to the overall concern of the conference, would be of interest in themselves. Among these, one may mention Massey's discussion of atomic and molecular reactions in space with particular reference to the abundance of various molecules in the interstellar medium and the earth's upper atmosphere; Sato's gasdynamical view of the motion, heating, and accretion of solid bodies in the solar system; Gehrels's interrelations of asteroids and comets; and Lindblad's account of meteor and asteroid streams.

The articles are well written and clear. Contrary to what is often the case in collections of symposium papers, the level of presentation is remarkably uniform and such as to be understandable and rewarding to the nonspecialist in the field.

The editor acted with commendable speed to have the book ready within a year after the symposium. A consequence, however, is that occasional typographical errors have slipped in. One, amusing rather than serious, is the frequent reference to Toro's "perihelium."

In summary, the book is distinguished by a number of fine papers and carefully preserved conversations on a wide variety of topics related to its central problem. Almost anyone with a general concern for the origin of the solar system will find many articles of lasting interest. It is certain to be a useful library source for workers in the field.

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Parasites

The Trypanosomes of Mammals. A Zoological Monograph. CECIL A. HOARE. Blackwell, Oxford, England, 1972 (U.S. distributor, Davis, Philadelphia). xviii, 750 pp. + plates. $34.50.

In 1904 Laveran and Mesnil published the first edition of their *Trypanosomes et Trypanomiases*, and in 1912 the second edition. Despite the medical and veterinary importance of the trypanosomes, and despite the fact that thousands of papers have been written on them, Hoare's book is the first on these Protozoa since 1912. It is oriented toward the parasite rather than the host, being devoted primarily to zoological aspects rather than to the diseases (if any) caused by the parasites. When Laveran and Mesnil wrote their book, they described 56 species of *Trypanosoma* from mammals, but only 34 of them have stood the test of time. Many additional species have been named, and Hoare takes up about 125.

Trypanosomes occur in all groups of vertebrates, but most of the known species are found in mammals; these are all that Hoare includes in his book. General discussions of history, structure, life cycle, diagnosis, classification, evolution, and host-parasite relations take 118 pages, after which there is a systematic discussion of each species for 488 pages. A 31-page host-parasite checklist gives the names of the trypanosomes which have been found among about 400 species of mammals belonging to 218 genera and 12 orders. This is followed by a 79-page list of references and a 27-page index.

Trypanosomes cause disease primarily in the tropics, but there they are extremely important, in both the Old and the New World. Sleeping sickness of man, caused by a trypanosome, was an important cause of death in Africa; Chagas' disease, caused by another trypanosome, is a serious public health problem in South and Central America, where about 10 million people are infected. Nagana and related diseases, also caused by trypanosomes, have interdicted much of sub-Saharan Africa for livestock raising, and surra is a problem wherever camels are or have been.

Because there are many trypanosomes, some pathogenic and some not, and because a great deal has been written about them, our comprehension of them is confused. Hoare's book is welcome because it assembles and organizes the confusing details in a critical fashion. It is an authoritative, thorough, and readable review of our knowledge of all the species found in mammals and will serve as a basis for all future studies on them.

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Books Received

Advances in Computers. Vol. 12. Morris Rubinoff, Ed. Academic Press, New York, 1972. xii, 436 pp., illus. $19.50.

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Advances in Librarianship. Vol. 3.