scopic detail. H. Reeves discusses the cosmological significance of the abundances of elements and isotopes in an interstellar medium composed partially of primordial material.

The price of the book deserves comment, particularly in light of the informality of the printing (photoreproduced typescript replete with extraneous black marks) and the apparent lack of editorial attention (there are numerous misspellings and occasional grammatical errors). The benefits of summer schools like Les Houches could surely be spread more widely if sponsoring agencies were to underwrite more of the cost of publishing their proceedings.

JOHN H. BLACK School of Physics and Astronomy, University of Minnesota, Minneapolis

Mycology

The Fungal Spore. Form and Function. Papers from a symposium, Provo, Utah, 1974. DAR-RELL J. WEBER and WILFORD M. HESS, Eds. Wiley-Interscience, New York, 1976. xvi, 896 pp., illus. \$30.

The last 15 years have seen an increasing interest in the study of cryptobiotic systems as models for studying developmental changes in microorganisms. Although the formation, maintenance, and breaking of the cryptobiotic state in dormant spore systems have been among the most intriguing of biological processes, the basic control mechanisms are not yet clearly understood.

Intensive conferences on the technology, biochemistry, and molecular biology of bacterial endospores have contributed to significant progress in understanding these endospores in the past 20 years, but fungal spores have until recently received insufficient attention. This book is an important contribution that highlights the nature of fungal spores, their unique structures, and the mechanisms that may be involved in breaking the dormant state. In addition, the book gives accounts of a variety of fungal spores. Detailed cytological descriptions of organelle changes and structures are included, as are interesting discussions of self-inhibitors, activation mechanisms, and problems related to the physiology of the dormant state and germination.

Although knowledge of the molecular basis of cryptobiosis in these eukaryotic spore systems is no more advanced than it is in bacteria, some important differences have been observed. Among matters deserving of further study are the stable messenger RNA that is carried to the spore state, the level of regulation, and the importance of structural elements (for example, polarity on mitochondria) as determinants in morphogenesis. The combination of detailed studies of structure and consideration of physiological and biochemical functions holds promise for future research on fungal spores. Of particular interest is the record in the book of the session in which the various participants discussed their perspective on future developments in work with this system.

Fungal spores are of interest to scientists concerned with developmental systems. This book includes relatively little information concerning the initiation of and the developmental changes involved in spore formation. One hopes that future conferences on fungal spores will deal with sporulation and will also compare fungi with other spore-forming organisms. Detailed analyses of fungal spore formation, maintenance of the dormant state, and germination are appropriate bases for comparative studies of sporology. This book, therefore, serves as an excellent introduction to the field.

HARLYN O. HALVORSON Rosenstiel Basic Medical Sciences Research Center, Brandeis University, Waltham, Massachusetts

Growth Inhibitors

Chalones. JOHN C. HOUCK, Ed. North-Holland, Amsterdam, and Elsevier, New York, 1976. xiv, 510 pp., illus. \$63.50.

Chalones are naturally occurring inhibitors of cell proliferation whose function is supposedly to control the growth of tissues. Chalones that act in the G_1 and G_2 phases of the cell cycle have been isolated. The purpose of this book is to present an up-to-date review of chalone research, which has been trying to get off the ground for some time but has had difficulties. The book reviews current knowledge of the principal chalones, such as those isolated from epidermis, fibroblasts, melanocytes, granulocytes, lymphocytes, bronchial epithelium, liver, smooth muscle, colon, and tumors. The purity that has been achieved in the isolation of chalones varies greatly, the preparations ranging from crude extracts, such as those obtained from smooth muscle, to very pure ones, such as the G₁ chalone of the epidermis isolated by Mark and his co-workers. This book also clearly attests that it is relatively easy to obtain an extract that is capable of inhibiting cell proliferation of the tissue or organ from which it was obtained, but that it is much more difficult to present convincing evidence that the control of cell proliferation is indeed the physiological role (or one of the physiological roles) of the substances isolated. Certainly this is one of the important areas for future investigation in the field, as most workers are well aware.

In the past, the chalone field has suffered from being somewhat insular. The book indicates that the situation is changing. Perhaps one of the best indications of this is the willingness of many of the authors to admit that stimulators (interestingly, usually referred to as antichalones) exist and that they may have a role in growth control. Discussions of the problems of isolating chalones and characterizing their role also seem more open-minded. The book does a special service by including several chapters on the technical problems that arise in the isolation and assay of chalones.

The "chalonists" still have some odd quirks. Many of them refer to M. Abercrombie as the chief proponent of the theory that growth control is effected by stimulators, and cite his paper on the wound hormone hypothesis (Symp. Soc. Exp. Biol. 11, 235 [1957]) as the chief source of the theory. Even a not very careful reading of that paper will reveal that Abercrombie did not propose that growth was universally controlled by stimulators. He kept an open mind, suggesting inhibitors where the available data indicated them. Only in wound repair did he suggest that an endogenous stimulator, a wound hormone, might be operating, and in that situation it probably does.

In spite of some unevenness in the quality of writing, the book gives a good account of the status of the field.

THOMAS S. ARGYRIS

Department of Pathology, Upstate Medical Center, State University of New York, Syracuse

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The Aerospace Environment. Tom Beer. Wykeham, London, and Springer-Verlag, New York, 1976. xiv, 146 pp., illus. Paper, \$8.60. The Wykeham Science Series.

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RESEARCH NEWS

(Continued from page 714)

12 patients at least did not progress; that of three patients showed definite improvement; and that of two additional patients may have improved.

This was not a controlled study but the NHLBI is now sponsoring a more extensive clinical trial, involving several clinical centers, to confirm that the surgical technique can cause improvement of atherosclerotic lesions in patients with coronary artery disease. The trial will ultimately include 1000 patients; 500 will undergo the surgery and 500 will be treated conventionally.

A sensitive technique for observing what is happening within the arteries before atherosclerotic lesions become large enough to actually block the vessels and cause symptoms could help to provide information about whether or not early lesions will regress. David Blankenhorn and his colleagues at the University of Southern California have applied computer technology originally developed for analysis of photographic images taken by spacecraft to the analysis of angiograms of the femoral artery of the thigh. With their technique they can visualize the plaques and determine whether they change in size over a period of time.

The investigators have performed a series of angiograms on 25 men who have high concentrations of lipids, including cholesterol, in their blood. Before therapy to reduce the blood lipids and also high blood pressure, where required, the men all had moderately severe atherosclerosis of the femoral artery but did not yet have symptoms of obstruction. Blankenhorn is using a variety of drug and diet therapies on the men. After 13 months of treatment, nine of the 25 patients experienced regression of the lesions, whereas the lesions of 13 got worse and those of three did not change.

Blankenhorn says that the patients whose lesions regressed showed significant declines in blood cholesterol concentration; these decreases did not occur in individuals whose disease progressed. Statistical analysis of the data indicated that decreases in blood pressure made an independent contribution to the rate of change of the atherosclerosis, with a decrease favoring regression. Blankenhorn thinks that the changes in the femoral artery are representative of those that may occur in early lesions of the coronary arteries, but confirmation of this hypothesis will require the development of a similar technique for examining the coronary arteries.—JEAN L. MARX

BOOKS RECEIVED

(Continued from page 718)

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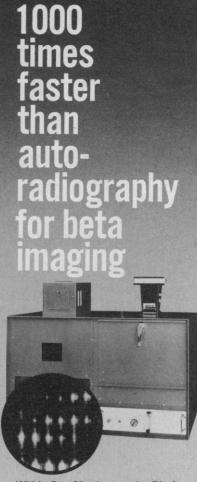
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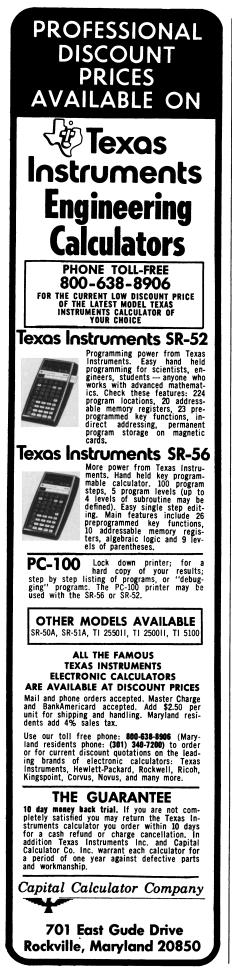
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