rope, by espousing the new doctrine, wormed out of their previous obligation to feed the hungry.

I am far less troubled with chapters 11 ("Forbidden flesh") and 12 ("The origin of the sacred cow"), perhaps because these are outside my field of expertise. But the theoretical approach of the book seems to explain adequately the strange business of food taboos. A corollary to the theory is that supernatural sanctions get put on nutritionally valuable species that not only progressively become more expensive but begin to endanger the existing mode of subsistence. Harris relates the Jewish taboo on the pig, for instance, to the destruction of the Palestinian forests; in the absence of forests not only would swine have had to be fed with valuable grain, shelter would have had to be found for these woodland-adapted, relatively hairless, and sun-sensitive creatures.

"Higher" civilizations are handled in the final three chapters. Chapter 13 ("The hydraulic trap") embraces Wittfogel's view of the Oriental despotic state (shades of Dr. Fu Manchu!), a theory that was presaged by the "Asiatic mode of production" of Marx. Although Harris seems sometimes to feel that the recurrent cycles postulated by Wittfogel of dynastic rise and fall are restricted to the Orient, he inconsistently adopts the hydraulic or irrigation theory as a good one to explain the rise of states everywhere. In the case of Mesoamerica, notwithstanding very limited data advanced by Sanders and MacNeish, this just does not work. Chapters 14 and 15 bring us to our own world. Here Harris puts forth the origin of capitalism and parliamentary democracy as a Western response to the recurrent crises caused by population pressure and intensification processes, opposing it to the bureaucratic and despotic response of the Orient. Since the business of business is to make money, the capitalist response has been, through science and technology, to make production cheaper. Whether we have reached a new crisis due to declining sources of energy Harris leaves open.

What to say about this book? In spite of errors of typography and substance, it made me question my own data and assumptions. It stimulated me to question accepted theories of culture. And it made me think that Harris might have something, after all. This volume is recommended reading for every variety of believer and nonbeliever.

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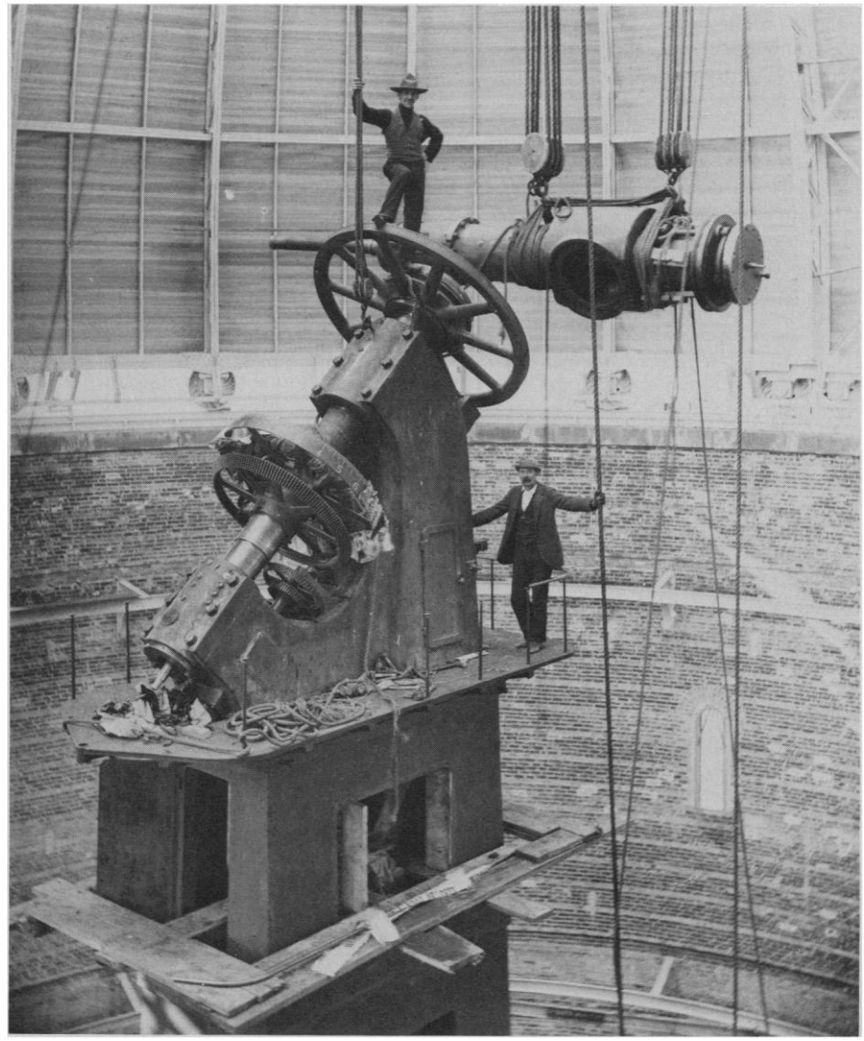
Astronomers and Nebulas

Man Discovers the Galaxies. RICHARD BERENDZEN, RICHARD HART, and DANIEL SEELEY. Science History Publications (Neale Watson), New York, 1976. x, 228 pp., illus. Cloth, $15.95; paper, $6.95.

This book offers a brilliant picture of the interplay between personalities and evidence in the development and, more important, the acceptance of scientific ideas. In the period under consideration, roughly 1915 to 1940, astronomers determined that our Milky Way galaxy was of a size much larger than had previously been believed and that spiral nebulas, the so-called island universes, were in fact similar galaxies external to and far distant from our own.

En route to our current understanding astronomers found that the solutions to one set of problems contradicted those to other problems. The authors of this book clearly expose the strengths and weaknesses of opposing views, leading the reader to understand that support for one position or another was often based on nothing more substantial than personal prejudice. For instance, Harlow Shapley's acceptance of Adriaan van Maanen's (incorrect) results concerning the rotation of spiral nebulae is repeatedly attributed to his friendship with the Dutchman. And Shapley's model of our galaxy gained acceptance largely because of Shapley's forceful, self-confident personality.

The astronomical community, as presented in this book, is not always a team whose members cooperate in a disinterested search for the truth. The great debate of 1920 between Shapley and Heber Curtis, the leading proponent of the island universe theory, is described as a "confrontation," a zero-sum game in which one man would win and the other lose. Very little is said about the person-



Installation of the mounting for the 40-inch telescope at Yerkes Observatory. [Yerkes Observatory photograph, University of Chicago, Williams Bay, Wisconsin; reproduced in *Man Discovers the Galaxies*]

al satisfactions of a job well done, while emphasis is given to recognition from the public, from peers, and from posterity. Despite the obvious and constant reliance of theory on observation, the former is presented as the more worthy activity.

The book is aimed at a general audience. The authors expect it will prove most useful to college students taking introductory astronomy courses for nonscience majors.

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Symbioses

The Biology of Symbiotic Fungi. RODERIC COOKE. Wiley, New York, 1977. xii, 282 pp., illus. $22.95.

Fungal symbiosis is currently of much interest in biology. Cooke has presented this important, but often misinterpreted, phenomenon in a timely and concise book for undergraduate and postgraduate students.

Dealing with both animals and plants, Cooke defines the concepts of fungal symbiosis broadly, in line with modern thinking and research on the subject. He writes in the preface that he has accepted "de Bary's original broad concept of symbiosis as meaning simply 'living together.' " The difficulties and fallacies of past concepts of symbiosis are discussed, as well as the problems inherent in modern approaches.

The book begins with a section on concepts of fungal symbiosis, in which the classification of symbiotic fungi is discussed. There are sections on antagonistic, neutral, and mutualistic symbioses with animals, on antagonistic and mutualistic symbioses with plants, and on interfungal symbioses. Cooke gives "rather more detail" about the symbioses between fungi and animals than he does about the symbioses between fungi and plants because, as he says, the former "are the least familiar, and the literature concerning them is frequently not easily available."

Each chapter treats a specific type of fungal symbiosis, with discussions, for the most part clear and to the point, of the taxonomy and morphology of the fungus and the ecological, physical, and physiological aspects of the symbiotic relationship. Although slightly skewed in favor of the physiological, the discussion is reasonably well balanced between the different aspects of these unique relationships. In addition, many chapters include discussions of the use and potential use of certain symbiotic fungi as biological control agents.

The majority of the chapters are illustrated with line drawings, photographs, and electron micrographs, although many of the photomicrographs and electron micrographs are poorly reproduced—an unfortunate flaw in an otherwise error-free book.

Cooke writes in the preface that the book is intended to be a concise treatment of fungal symbiosis that draws together literature from a large number of sources, many of which are not readily accessible. He has succeeded in his goal.

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Steroid Hormones

Biochemical Actions of Progesterone and Progestins. Papers from a meeting, New York, May 1976. ERLIO GURPIDE, Ed. New York Academy of Sciences, New York, 1977. vi, 450 pp., illus. Paper, $41. Annals of the New York Academy of Sciences, vol. 286.

Although publications derived from conferences often lack coherence and immediacy, those responsible for this volume have assembled a series of generally timely papers of high quality on specific research projects concerned with progesterone-protein interaction, steroid hormone receptors, and the consequent mechanisms of action.

Of special note are the papers from O'Malley's group, one of which indicates that chick oviduct progesterone receptors have a molecular weight of 200,000 and a structure of two dissimilar steroid binding subunits. There are also papers on the effect of progesterone receptors on transcription and the interaction of progesterone receptors with chromatin. The report from Schimke *et al.* on ovalbumin synthesis raises questions about the hypothesis that steroid hormone action is directed solely through transcription of specific messenger RNA's and indicates possible alternatives through control of utilization of mRNA's.

There is a section on studies of progesterone receptors in breast cancer, including attempts to use these receptors in addition to estrogen receptors as a basis for selecting patients for hormonal therapy.

Recent work on the regulation of receptor synthesis and replenishment by hormonal manipulation is covered in a series of papers that introduce additional factors that play a role in the control of steroid hormone action. It has been shown that estrogen stimulates progesterone receptor protein formation and that progesterone then decreases cytoplasmic estrogen receptors as well as its own receptor. An understanding of the synergistic and antagonistic interactions of these two steroids may be emerging.

The remaining papers in the volume cover studies, at various levels of biological organization, of a wide range of progesterone effects, including action in the central nervous system, action during pregnancy, and glucose and lipid metabolism in humans.

In all, the book is representative of some of the best work being done on progesterone binding and action. Unanswered questions and controversies are evident from the range of papers and the short discussions that follow each. Reading the volume is a convenient way to survey the state of the field.

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Advances in Enzyme Regulation. Vol. 15. Proceedings of a symposium, Indianapolis, Sept. 1976. George Weber and Catherine E. Forrest Weber, Eds. Pergamon, New York, 1977, xvi, 452 pp., illus. $60. *To order this book circle No. 386 on Readers' Service Card.*

Air Pollution. Phytotoxicity of Acidic Gases and Its Significance in Air Pollution Control. Robert Guderian. Translated from the German by C. Jeffrey Brandt. Springer-Verlag, New York, 1977. viii, 130 pp., illus. $24.80. Ecological Studies, vol. 22. *To order this book circle No. 362 on Readers' Service Card.*

Annual Review of Birth Defects, 1976. Proceedings of a conference, Vancouver, B.C., Canada, June 1976. Daniel Bergsma and R. Brian Lowry, Eds. Liss, New York, 1977. 4 parts, illus. Part A, Numerical Taxonomy of Birth Defects and Polygenic Disorders. xiv, 164 pp. $20. Part B, New Syndromes. xvi, 268

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