Maya civilization, but it is difficult to look at the monuments and remains of this civilization without believing that this role must have been an important one." To be sure, the subject of ideology is not ignored altogether, but where it is discussed it is seen as being of secondary importance. The impression one is left with is of the Maya competing away with one another as if they had been convinced by a team of prehistoric U.S. Commerce officials that competition is the only road to success.

I do not see much evidence of competition at Tikal until this center was well advanced on the road to civilization. This seems important, for, as the contributors to this book recognize, Tikal took an early lead in the development of lowland Maya civilization. What I do see at Tikal may be interpreted as people cooperating to solve problems of wind, water, and crop pests, which are known to make swidden agriculture a risky proposition at Tikal. Their response to this was the development of a strong religion that attempted to control the uncertainties of nature. In keeping with practices among neighboring peoples, special ritual paraphernalia, used in permanent religious centers, were important in the religion they developed. And at Tikal, the first craft specialization seems to have developed in the service of religion, just as the first masonry architecture was for religious purposes. In other words, religion seems to have provided the impetus for occupational specialization and management, which were to develop into key elements of civilization.

Tikal, then, as an early religious center required the services of a variety of people, from priests to the artisans who produced the religious paraphernalia. They could operate most effectively by living where their services were required. Beyond this, the religious importance of Tikal probably acted as a kind of magnetic attraction to others. Thus, I see religion as a primary nucleating force that created an artificially high population density at Tikal, a density that by 200 B.C. exceeded the support capacity of swidden agriculture. The solution to this was agricultural intensification, which ultimately allowed for further population buildup and further occupational specialization, both of which required more in the way of political organization just to keep the system working.

WILLIAM A. HAVILAND
Department of Anthropology, University of Vermont, Burlington 05401

Struggles of Human History

Cannibals and Kings. The Origins of Cultures. MARVIN HARRIS, Random House, New York, 1977. xii, 242 pp. $10.

As an idealist, I had expected thoroughly to dislike this book by a dyed-in-the-wool material determinist. It is true that I found something to infuriate me on almost every page, but I also found much that was instructive, entertaining, and perhaps even convincing.

Harris's main theoretical position, which he rigorously maintains throughout the 15 chapters, is that

> Reproductive pressure, intensification, and environmental depletion would appear to provide the key for understanding the evolution of family organization, property relations, political economy, and religious beliefs, including dietary preferences and food taboos.

Now that is a big order, but Harris is no intellectual coward, and he touches on an incredible range of societies, from primitive hunters and gatherers to Melanesian "big man" agriculturalists to modern industrial capitalism. In certain cases, Harris not only proves his point but genuinely illuminates matters that have long puzzled anthropologists and social historians. In other cases, his argument, which seems to derive in equal parts from Marx, Wittfogel, and Boserup, loses its force through a poor handling of sources and data. I will touch upon a few of these successes and failures.

In chapter 2 ("Murders in Eden"), Harris attempts to show that hunters and gatherers lived a far more prosperous life than that described by Thomas Hobbes, mainly by keeping their populations low through artificial means such as infanticide. This rosy picture of the preagricultural standard of living may in part be valid for selected regions, such as southern Europe during the Late Pleistocene or the maritime Arctic and sub-Arctic of North America, but is denied by eyewitness accounts of the Algonkian hunters of the North American taiga, such as the Ojibwa; all too frequently we read of death through starvation during the long winters, recurrent cannibalism, and the psychotic fear of the cannibalistic windigo monster. In many instances, sheer lack of food in lean times may have been the factor limiting population growth in hunting and gathering societies.

Warfare is another population-regulating mechanism invoked by Harris. Why is it universal? Explanations vary according to the sociopolitical level achieved by a particular society, but at least in its origins it was a mechanism to disperse populations, and, like infanticide, to depress the rate of population growth. A curiosity of intellectual history is that this view is identical to the position of the late, and very right-wing, Sir Arthur Keith, that war is "nature's pruning-hook." Harris sees in war the *fons et origo* of male supremacy, as well as female penis-envy and the Oedipus complex. Far-fetched? I doubt it.

I find myself unable to swallow the theses of chapters 8 and 9, which concern my "own" area, Mesoamerica. The data Harris uses are either wrong or out of date, and often both. Let me overlook the mishandling of Olmec archeology and concentrate on Aztec cannibalism. Here Harris's broad brush has spattered more paint on the walls and floor than on the canvas. Harris enthusiastically adopts a sensational thesis first promulgated by Michael Harner that cannibalism, so shocking to Western observers, was the direct result of protein deficiency. According to Harner and Harris, the late pre-Conquest Aztec had so depleted the resources of the Valley of Mexico that their elite class resorted to cannibalism to provide themselves the high-quality protein not available to the commoner class. As John Pfeiffer has remarked to me, this is the ultimate Marxist explanation: the ruling class not only exploits everybody else, it eats them. There is no space to go into the sources and data involved in this complex subject (Mayanists will be pleased to note that Harris has delved into the "Dresden Codex, a sixteenth century book written in Nahuatl"), but suffice it to say that most specialists in the subject, such as the outstanding authority on the Aztec, Henry Nicholson (not cited by Harris), view the Aztec eating of captives as something closer to the Christian Eucharist than as a need to make up for the alleged deficit of beans and flesh. There are ample data indicating that all strata of Aztec society had full access to both animal and plant protein.

But wait! Harris also has an explanation for the Eucharist. In chapter 10 ("The lamb of mercy"), he makes sure that he steps on everyone's toes by holding that the Body and Blood of Our Lord are little more than a nutritionless substitute for the real food that had once been the focal point of great redistribution feasts of "big men" in chief-run societies. The rulers of early Christian Eu-

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.

MICHAEL D. COE
Department of Anthropology,
Yale University,
New Haven, Connecticut 06520

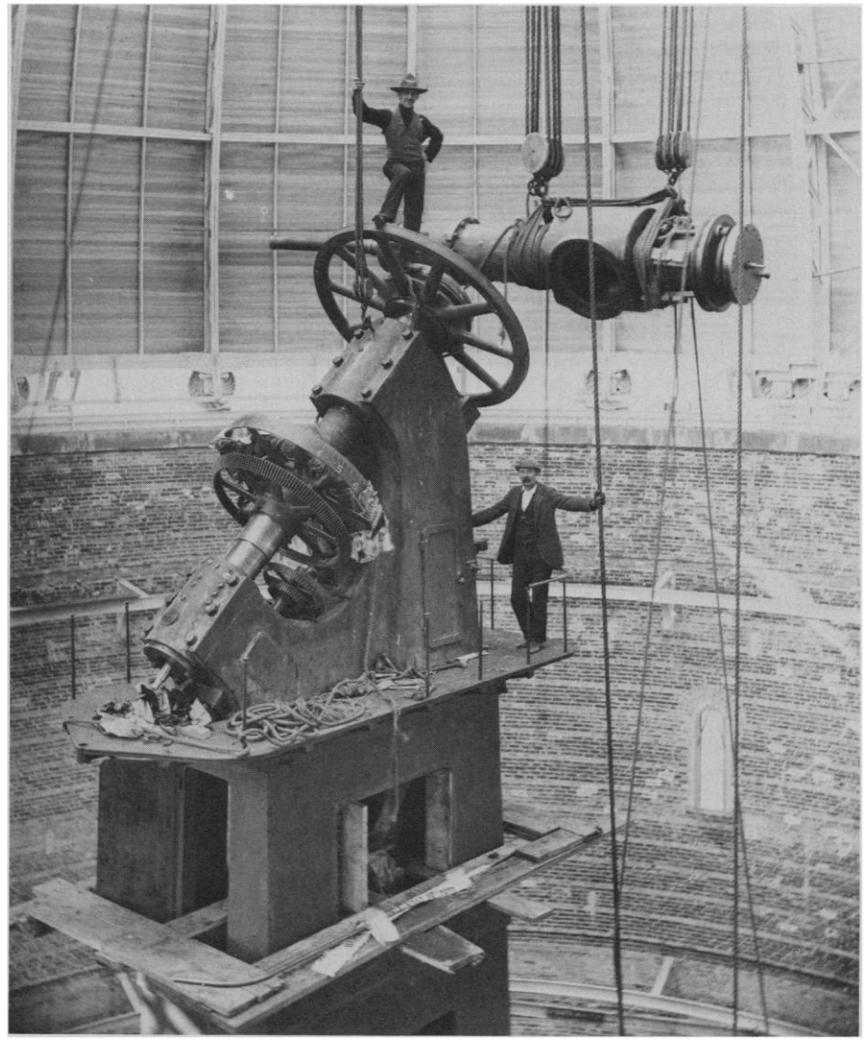
Astronomers and Nebulas

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*]