the American mythic figures Paul Bunyan and Lewis Babbitt. They carried to a large audience Benedict's sense of the importance of cultural differences and at the same time her concern that an individual not be swamped by his or her culture.

This is not the definitive biography of Ruth Benedict. Another scholar may someday document more fully the influences on her and analyze more objectively her place in American science, scholarship, and public life in the 20th century. Meanwhile, however, we can be grateful for Modell's discreet probing into the mind and heart of this gifted, sensitive, and passionate woman.

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New World Ethnohistory

The Inca and the Aztec States, 1400–1800. Anthropology and History. GEORGE A. COLLIER, RENATO I. ROSALDO, and JOHN D. WIRTH, Eds. Academic Press, New York, 1982. xx, 478 pp., illus. $47. Studies in Anthropology.

In this volume a group of prominent scholars examine the Inca and Aztec states during that critical time period just prior to and immediately following the Spanish Conquest. The volume is divided into five parts. The first consists of a lone comparative analysis of the political economy of the Inca and Aztec states by Pedro Carrasco. Part 2, Aztec State Formation, contains chapters by Edward Calnek and J. Rounds. Part 3, Inca State Administration and Colonization, contains chapters by John Rowe, Catherine Julien, Craig Morris, and Franklin Pease G.Y. Part 4, The Imposition of Spanish Governance, contains chapters by Woodrow Borah, Steve Stern, and Karen Spalding. Part 5, Indigenous Culture and Consciousness, contains chapters by J. Jorge Klor de Alva, James Lockhart, Frances Karttunen, and R. Tom Zuidema.

The book begins with an introduction by George Collier on "new directions in Mesoamerican and Andean ethnohistory" in which the contributions are reviewed and some general conclusions are drawn from them. For example, Collier observes that organizational patterns of early colonial Indian groups probably reflect pre-Conquest patterns and that the Mesoamerican and Andean civilizations were not disrupted nearly as much as has been traditionally assumed. Such generalizations as these are not particularly novel, and with respect to the rationale for the book Collier simply states that it brings together new "empirical understanding" of the Inca and Aztec civilizations and their post-Conquest development and "illustrates the strategies with which anthropologists and historians have pursued the understanding."

Most of the chapters in this volume are self-contained units, each with its own data base, research focus, and worldview. Most of the authors either attempt to use the theoretical work of other social scientists as a framework for organizing their data (Rounds, Pease, Morris, and Zuidema) or make no use of an explicit theoretical framework and simply present bodies of empirical data (Rowe, Murra, Calnek, Wachtel, Julien, and Lockhart). In both cases, the presentation of the data is the exclusive goal, and ultimately no effort is made to place them in a broader perspective. Furthermore, in Collier's introduction he makes it clear that there was a feeling among the contributors that there are not enough data on the Inca and Aztec polities to permit valid generalizations or comparative statements about processes across cultures. "Willingness to generalize and compare thus makes sense to the degree that empirical understanding of these civilizations in their own terms has matured" (p. 2).

In thus electing to await the "maturation" of the empirical documentation of the Inca and Aztec civilizations, the majority of authors in this volume place themselves in the same position archeologists were in 25 years ago, and ethnographers 50 years ago. The belief that the collection of "enough" data will somehow provide answers to questions about Inca and Aztec organization, or the reactions of the Inca and Aztec people to the Spanish colonists, or the administrative practices of the Spanish harks back to Boasian historical particularism. Unfortunately, data do not speak for themselves, and the collection of data without a guiding problem orientation and outside of an explicit theoretical framework is a comparatively unproductive research strategy.

There are exceptions to the pattern of particularistic data gathering. The chapter by Spalding on "exploitation as an economic system" demonstrates most clearly the value and utility of extending one's vision beyond the confines of documents. Though Spalding focuses on one aspect of the economic system in colonial Peru—namely, the extraction of surplus by the colonial regime—she places her analysis in a much larger global and theoretical perspective. Specifically, her presentation of data on the coercive and exploitative policies of the Spanish is prefaced by a discussion of how such data will provide a more solid foundation for understanding both the evolution of the world capitalist economic system and the economic "underdevelopment" plaguing Latin America today. Spalding does state that it is time to "move beyond assertion and theoretical argument," but she does not take the regressive step of throwing out theory and generalization. She *uses* theory and broader problem orientation to guide her research and data collection.

One of the most insightful contributions in the book is Stern's lucid analysis of "judicial institutions in an exploitative society." He places his historical discussion of judicial institutions in the colonial city of Huamanga (present-day Ayacucho), Peru, in the context of a much broader debate over the role of state legal systems in either furthering the exploitation or easing the pain of oppressed populations. He argues that even though the native Indian population made extensive use of the Spanish legal system (a number of the papers point out that the aboriginal populations readily adopted and utilized Spanish laws and courts) the system as a whole was working against them:

> In short, the juridical institutions that sponsored the extractions of a colonial ruling-class also gave the natives an opening by which to constrict exploitation. . . . Making the most of the opportunity, the native entangled exploitative practices in juridical labyrinths whose final outcomes were often uncertain. In the end, the Indians' struggle for Spanish justice weakened their capacity to mount a radical challenge to the colonial structure, and thereby contributed to the dominance of a colonial elite [p. 293].

Carrasco is the only author to accept the implicit challenge of the volume title and attempt to compare the Inca and Aztec societies. In a broad overview of the political economy of the two states, he points out that there are indeed major similarities between them. In both, for example, markets play a secondary role in distributing resources and do not dictate production. There are two categories of land, that which is held and used by the peasants for their own support and that which is held by the governing body and exploited through labor services extracted from the peasants. Surplus, in the form of resources and labor, was used by the governing body for self-support, public works projects (particularly irrigation systems), and what Carrasco calls "ostentation," manifested in the elaborate religious activities of the Inca and Aztec rulers. Though acknowl-

edging major differences between the two polities, Carrasco questions whether these may not be due primarily to the fact that the Inca had more time to consolidate their power and achieve a higher level of "imperial" integration.

Though I would like to debate certain points in Carrasco's analysis, such as his inference that the Inca and Aztec empires were organized along the lines of nested chiefdoms, I think his chapter is an outstanding illustration of how currently available data can be effectively utilized in making generalizations and comparisons about the political and economic organization of the civilizations of the Incas and Aztecs. Other contributions in the book certainly add to our "empirical understanding" of Incas and Aztecs, but the rejection of theory and unwillingness to generalize seriously detract from the potency of the volume as a whole.

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The Orion Nebula

Symposium on the Orion Nebula to Honor Henry Draper. New York, Dec. 1981. A. E. GLASSGOLD, P. J. HUGGINS, and E. L. SCHUCKING, Eds. New York Academy of Sciences, New York, 1982. xii, 338 pp., illus. Cloth or paper, $65. Annals of the New York Academy of Sciences, vol. 395.

On 30 September 1880 Henry Draper, a New York physician and amateur astronomer, took the first successful photograph ever made of the Orion Nebula. A 51-minute exposure on a slow blue plate, taken with an 11-inch aperture, *f*/14 refracting telescope, the photograph shows very little of this wonderfully complicated, nearby ionized gas cloud. Yet Draper's blurry picture is the direct ancestor of the spectacular large-scale Schmidt photographs we are accustomed to seeing in textbooks, coffee-table volumes, and even advertisements for television sets today. More important, the picture represented a breakthrough in the scientific study of the Orion Nebula, and hence of interstellar matter. It provided a permanent, objective, measurable image of the nebula. From Draper's day to our own, every new radiation detector, every new telescope, optical, radio, or infrared, every new method of astronomical research has been applied to the Orion Nebula. It is the nearest and therefore by far the best-studied sample of interstellar matter we have. Astronomers cannot do experiments, but they can measure, and they have measured the Orion Nebula in every way they can. It is the closest equivalent to an interstellar laboratory that there is.

This volume contains the papers presented at a symposium on the Orion Nebula held at New York University just 101 years after Draper's photograph was taken. Experts discuss their most recent observational results in every wavelength band from the vacuum ultraviolet to the radio-frequency region. Theorists analyze and interpret not only the state, structure, and dynamics of the cloud of gas and dust, but also the star formation that is going on in it before our eyes.

The Orion region contains a dense, giant cloud; the nebula that we see in the photographs is a small part of it on the near side, ionized by the bright OB stars of the Trapezium. Most of the material in the clouds is molecular, and high–angular-resolution measurements in the CO 2.6-millimeter emission line have revealed much of its structure. This work is very well summarized and reviewed by Thaddeus. The optical studies, including ultraviolet measurements made from rockets and satellites above the earth's atmosphere, are surveyed in another excellent paper, by Peimbert. One very interesting recent result is that the light we see in the faint outer parts of the nebula is not emitted there; it is mostly radiation from the bright central core, scattered by dust in the low-density regions far from the Trapezium.

Both of these papers, and many others, show convincingly that simplified models cannot be used to interpret the Orion Nebula. It is too complicated. There are density condensations, shock fronts, streams of gas, and edge effects. But we are close enough to observe directly, and thus recognize, these complications. Star formation does not occur in idealized spherically symmetric nebulae, but in real objects like the Orion Nebula. The density fluctuations, deviations from sphericity, clustering, and effects of the first stars formed on the formation of later generations can be taken into account through the use of the empirical data, as Silk and Larson demonstrate. A discussion of shock waves in the clumpy interstellar medium by Spitzer is particularly good. Direct observations of the regions of recent star formation by filter photography, described by Herbig, show that, although many recently formed stars can be identified, many more are probably still hidden within the dust.

This volume is an excellent survey of recent research in one of the most interesting fields of astronomy. Two very good historical papers on Draper as a pioneer of observational astrophysics, by Gingerich and Plotkin, bring it to a close.

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A Psychobiology of Reward

The Neural Basis of Feeding and Reward. Proceedings of a symposium, Los Angeles, 1981. BARTLEY G. HOEBEL and DONALD NOVIN, Eds. Haer Institute for Electrophysiological Research, Brunswick, Maine, 1982. x, 566 pp., illus., + index. Paper, $39.95.

The field of physiological psychology, from its earliest beginnings, has revolved around the issues of the regulation of food intake and the mechanisms of reinforcement. That these two subjects are related is made quite apparent in this volume, which is a collection of 45 papers that were presented at a satellite symposium of the 1981 meeting of the Society for Neuroscience. The papers demonstrate how far we've come from the early conceptions of feeding, satiety, and reward "centers" in the brain. The importance of peripheral factors, autonomic integration, afferent inputs, and neuropharmacological substrates is addressed in the book. More important, perhaps, is the effort on the part of all the authors to relate their approaches to the concept of reward. It is quite obvious that feeding is intimately tied up with reinforcement, and these papers make a genuine attempt to address the neurobiology of feeding as it relates to the neural substrates of reward.

The editors have arranged the papers in eight sections, with an introduction by Eliot Stellar, which puts the collection into historical perspective. The first section deals with some of the basic elements of feeding and reward. Particularly salient is the emphasis on the reflex elements of appetitive behavior. The subject is approached from comparative, developmental, and theoretical perspectives and provides a strong basis for the remainder of the book. The second section addresses the controversial issue of satiety and the role played by gut peptides in the control of food intake. Does cholecystokinin produce a satiety signal or simply make the animal uncomfortable enough to stop eating? Both sides of this issue are treated, and new approaches to the subject that use meal patterns as dependent measures are proposed. In