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