

development to private control of property (including women), pure household forms were abstracted from the disparate and messy evidence of ethnography.

Positing a few key organizational principles allowed anthropologists to develop elegant models of social structure. Thus, East African nomads were said to use kinship to build an ever more inclusive hierarchy of patrilineally linked descent groups extending from the family through the lineage and up to the clan and tribe. Given an ideal type, the variance reported in field data could be explained by environmental factors that distorted attainment of the ideal. In the prototypical analysis of this type, nearly half of the researcher's supposedly patrilineally linked informants actually traced their descent links through their mothers' families.

Recent work on kinship looks more closely at the interactions between what people say they should do and what they in fact do. *The Household Economy* is a collection of essays by anthropologists that make variation in household form and function the central analytic question, arguing that household economics must be understood through the filter of pre-existing social systems rather than as miniaturized, anonymous "firms" in the manner of neoclassical economic theory. The book is concerned with how internal patterns of authority and decision-making govern household economics; within households, gender and age are key factors determining who participates in economic activities and how their benefits are distributed.

The Household Economy contains three sections. The first gives an overview of recent developments in household studies. Particularly useful is Peggy Barlett's opening essay about why household diversity has become a focus of research interest for field anthropologists. Barlett underscores the methodological difficulties of studying social relationships within households, and particularly of selecting an appropriate time span for recording economic decision-making. Wilk also makes some good methodological points about household economics in non-Western societies: for example, microeconomic assumptions that households form pooled budgets and share decision-making do not stand up very well to field evidence from West Africa.

The second and largest section of the book consists of six ethnographic field reports, most of which appear to be abstractions of dissertation studies carried out in the early 1980s. By and large, the field data are well presented and convincingly explained. Case studies from Latin America, Africa, Europe, Asia, and the Pacific islands do a good job explaining why different

household forms play major roles in how family members gain access to economic resources. Thus, for example, among the Asante of Ghana lineage loyalty overrides household commitment: spouses farm land belonging to their own lineage, borrow money from their lineage mates more than from their marriage partners, and often even live with their kin in preference to their spouses. As a result, despite an ideology requiring women to defer to men, Asante women maintain control over their own property and show high degrees of independent economic decision-making.

The third section of the book introduces a relatively new aspect of anthropological research on social structure: it discusses the implications of household variation for agricultural research and development programs. Here Poats, Feldstein, and Rocheleau, in an excellent summary of the results of the first generation of social science infiltration into international crop research programs, show why an analysis of the needs, constraints, and production possibilities operating on different households will affect crop-breeding and extension strategies. Recognized in theory by plant-breeding centers, location-specific research based on the needs of small farm households is only gradually becoming a part of agricultural improvement programs. After two decades of development projects that all too often have bypassed or marginalized women, poor people, and politically weak populations, Poats *et al.*'s demand that development projects pay more attention to beneficiary analysis is a timely one.

By and large the essays in this book are best when they report ethnographic data. The book's theoretical generalizations tend toward the well known (losses in individuals' control over economic resources are correlated with losses in household decision-making) or are questionably phrased (Netting's contention that household farms involved in labor-intensive crop production are more "effective" than agricultural businesses). Periodic attempts to link up the analysis of intrahousehold processes with theories of political and economic development only underscore the absence of solid theory in this area.

Although in general the contributions are well written and ably edited, there are lapses into the fractured syntax that remains *de rigueur* in social science graduate programs. The book would have benefited from the inclusion of maps with the ethnographic reports so that the different cultural groups could be located.

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An Enduring Puzzle

The Moon Illusion. MAURICE HERSHENSON, Ed. Erlbaum, Hillsdale, NJ, 1989. xvi, 421 pp., illus. \$69.95.

The moon seen close to the horizon appears to be quite a bit larger than when viewed at its zenith. Similar apparent size changes occur for the sun and the distances between stars. This odd phenomenon is called the moon illusion and has been the subject of speculation since the time when the most obvious explanation—that the moon actually changes either size or distance from the observer during its nightly passage—had to be abandoned.

The extent of interest in this phenomenon is documented in this volume, which includes an extensive bibliography (285 sources, beginning with Aristotle). One would hope that the accumulated wisdom of 22 centuries of speculation followed by half a century of experimentation would result in some agreement as to the cause of the moon illusion. This book demonstrates that such agreement has not been realized.

On the assumption that the image of the moon on the retina remains the same whatever the moon's location, it might be expected that differences in perceived size are related to differences in perceived distance. This is in accordance with traditional visual perception theories, which postulate (i) that perceived size is derived subsequent to perceived distance and (ii) that for a constant visual angle an object that appears farther from the viewer should also appear larger and vice versa (this is known as the size-distance invariance hypothesis). Such an account would suffice were it not for the fact that viewers often report the horizon moon as appearing both larger and closer than the zenith moon.

By far the most influential account of the moon illusion is that proposed by Kaufman and Rock about 30 years ago and defended by them in this volume. Sometimes referred to as the further-larger-nearer theory, this theory postulates that the horizon moon is, in agreement with the size-distance invariance hypothesis, perceptually registered as being farther, and therefore larger, than the zenith moon; the anomalous distance aspect is a result of subsequent inferences based on the moon's perceived size—since the moon appears larger, it must be closer. This explanation creates an incongruity between the perceptually registered distance used to compute the moon's size and that which forms the conscious basis for its apparent distance; however, such inconsistencies have been noted before in a number of other perceptual phenomena. A few authors in

this book present variants of the further-larger-nearer proposal, but most reject it in favor of accounts ranging from physiological to cognitive explanations.

On the physiological side, one account claims that, owing to accommodative differences in the eyes' lenses, the retinal image of the moon is actually larger when viewed at the horizon (Roscoe). Another account (Enright) attributes the moon illusion to oculomotor adjustments that induce a phenomenon called micropsia. Although the phenomenon is too complex to review here, a sense of how it works can be obtained by doing the following demonstration, called Hering's maneuver: Hold your thumb out at arm's length directly below some far object, such as a picture on a wall. Maintain fixation and focus on your thumbnail while moving your thumb closer to you. Notice how the far object appears to shrink in size so long as focus is maintained on the near thumbnail. There are reasons to believe that the eyes fixate and focus at a nearer distance when viewing the zenith moon than when viewing the horizon moon, thereby making it appear smaller at its zenith.

Most proposals are of a cognitive nature. That is, they discuss forms of information processing that would require cortical neural mechanisms. Many relate the size of the moon to perceived distance in a manner that embeds perceived variables into geometrical laws. A number of authors propose that the moon illusion is the result of a multiplicity of different mechanisms rather than a single cause.

Finally, some contributors question whether the illusion is being approached from the right perspective at all. Haber and Levin, for example, question whether our perception of the moon's size and distance is mediated by the same processes that work under "normal" perceptual conditions. For example, the moon is over 2000 miles in diameter and almost a quarter of a million miles away, whereas most of our perceptual experiences are scaled to the size of our normal purview and actions.

The Moon Illusion contains a great deal of information about space perception that should be accessible to the general reader as well as to the specialist. Hershenson, the volume's editor and a contributor, concludes, "Is more research necessary? Yes, but not on the moon illusion! One lesson to be learned from this volume is that there is little agreement on a general theory of visual space perception. Therefore, a better understanding of visual space perception is probably a prerequisite to an understanding of the moon illusion" (p. 383). I agree with Hershenson's conclusion but doubt that his advice will be followed. The moon illusion is

evident to anyone who watches the skies. It demands attention and evokes a pervasive desire to explain a phenomenon that is both obvious and odd.

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Books Received

Acquired Traits. Memoirs of a Geneticist from the Soviet Union. Raissa L. Berg. Penguin, New York, 1990. xii, 483 pp. Paper, \$12.95. Translated from the Russian edition (New York, 1983) by David Lowe. Reprint, 1988 ed.

Adult Day Care. Findings from a National Survey. William G. Weissert *et al.* Johns Hopkins University Press, Baltimore, 1990. xii, 130 pp., illus. \$29.95. Johns Hopkins Series in Contemporary Medicine and Public Health.

Advances in Gene Technology. The Molecular Biology of Immune Diseases and the Immune Response. J. Wayne Streilein *et al.*, Eds. IRL (Oxford University Press), New York, 1990. xxii, 253 pp., illus. Paper, \$50. International Council of Scientific Unions Short Reports, vol. 10. From a symposium, Miami, winter 1990.

Advances in Statistical Methods for Genetic Improvement of Livestock. Daniel Gianola and Keith Hammond, Eds. Springer-Verlag, New York, 1990. xx, 534 pp., illus. \$79. Advanced Series in Agricultural Sciences, vol. 18. Based on a symposium, Armidale, Australia, Feb. 1987.

Alzheimer's and Parkinson's Diseases. Recent Advances in Research and Clinical Management. Harvey J. Altman and Barbara N. Altman, Eds. Plenum, New York, 1990. xiv, 614 pp., illus. \$110. From a conference, Detroit, Oct. 1988.

The Astronomer's Universe. Stars, Galaxies, and Cosmos. Herbert Friedman. Norton, New York, 1990. xxii, 359 pp., illus. \$24.95. Commonwealth Fund Book Program.

Astronomy with Your Personal Computer. Peter Duffett-Smith. 2nd ed. Cambridge University Press, New York, 1990. x, 258 pp., illus. \$59.50; paper, \$24.95.

Axonal Regeneration in the Mammalian Central Nervous System. A Critique of Hypotheses. D. E. Oorschot and D. G. Jones. Springer-Verlag, New York, 1990. viii, 121 pp., illus. Paper, \$52.40. Advances in Anatomy, Embryology and Cell Biology 119.

The Biology and Medicine of Signal Transduction. Yasutomi Nishizuka, Makoto Endo, and Chikako Tanaka, Eds. Raven, New York, 1990. xxxiv, 750 pp., illus. \$99. Advances in Second Messenger and Phosphoprotein Research, vol. 24. From a conference, Kobe, Japan, Oct. 1989.

Bonding Energetics in Organometallic Compounds. Tobin J. Marks, Ed. American Chemical Society, Washington, DC, 1990. xii, 305 pp., illus. \$64.95. ACS Symposium Series; 428. From a symposium, Miami Beach, FL, Sept. 1989.

Carbohydrate Chemistry. J. Thiem, Ed. Springer-Verlag, New York, 1990. viii, 334 pp., illus. \$99.50. Topics in Current Chemistry, 154.

Catastrophes and Evolution. Astronomical Foundations. Walter Alvarez *et al.* Cambridge University Press, New York, 1990. xii, 239 pp., illus. \$44.50. From a meeting, Oxford, U.K., Sept. 1988.

Ceramics in Energy Applications. New Opportunities. Institute of Energy, London. Hilger, New York, 1990. x, 285 pp., illus. \$80. From a conference, Sheffield, U.K., April 1990.

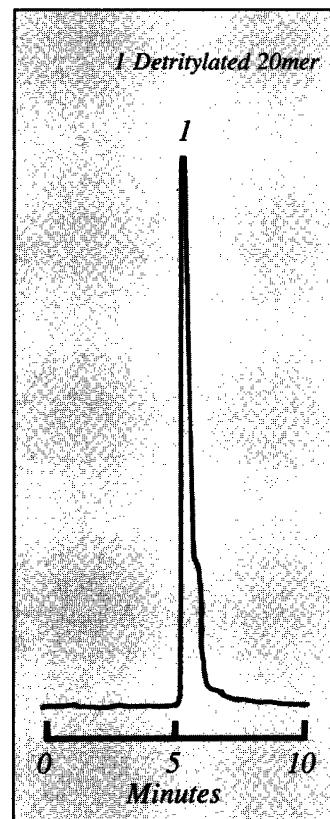
Changing Ideas in Health Care. David Seedhouse and Alan Cribb, Eds. Wiley, New York, 1990. xvi, 236 pp., illus. Paper, \$19.95.

Chemoreceptors and Chemoreceptor Reflexes. Helmut Acker, Andrzej Trzebski, and Ronan G. O'Regan, Eds. Plenum, New York, 1990. xii, 427 pp., illus. \$95. From a meeting, Warsaw, July 1989.

The Correspondence of Charles Darwin. Vol. 5, 1851-1855. Cambridge University Press, New York, 1990. xxxii, 705 pp., illus., + plates. \$39.50.

Cytomegaloviruses. J. K. McDougall, Ed. Springer-Verlag, New York, 1990. x, 279 pp., illus. \$79. Current Topics in Microbiology and Immunology 154.

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