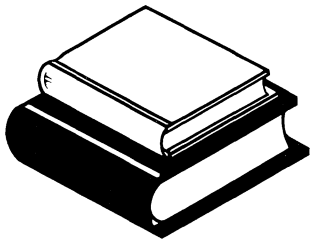
activity. These studies have made important contributions; in fact, many of the results of the NHSLS replicate, albeit with a larger or more representative sample, results of these earlier studies.

The mass media have given extensive coverage to some of the results of the survey. Generally, articles and stories have focused on single numbers, such as the mean number of sexual partners. The results have typically been used to reinforce traditional values such as heterosexuality, monogamy, and marriage. According to *U.S. News* (17 Oct. 1994), "Fidelity reigns." The *U.S.A. Today* (7 Oct. 1994) headline read, "We are 'sexually conventional.' " The bottom line in many media treatments, and in *Sex in America*, is that sex is not nearly as frequent, exotic, or important as many people thought it was. On the one hand, this is a reassuring message to many whose sexual activities do not involve multiple orgasms and multiple partners. On the other hand, it is a highly selective interpretation. One could as readily focus on distributions, for example, the number of partners since age 18 ranges from 0 to over 1000, and emphasize the diversity of sexual expression in the contemporary United States.

On the whole, the NHSLS is a major accomplishment. Thanks to the extraordinary time and effort invested by the principals, we have comprehensive data on the sexual activities of a representative sample of Americans 18 to 59. These data provide a baseline against which the results of future studies will be compared. The focus on and analysis of sexual networks, and the analysis of unions and their characteristics are innovative. The publication of these books has focused attention on the validity of self-report data, which may lead to some methodological advances. The major strength of the research is its major limitation as well; it is a quantitative survey. Surveys cannot assess the cognitive and emotional processes or the dynamics of social interaction that lead to sexual expression. What is needed now are equally well-done qualitative studies of these processes.

John DeLamater
Center for Demography and Ecology, University of Wisconsin, Madison, WI 53706, USA



Scale in Ecology

Species Diversity in Space and Time. MICHAEL L. ROSENZWEIG. Cambridge University Press, New York, 1995. xxii, 436 pp., illus. $74.95 or £50; paper, $27.95 or £17.95.

Macroecology. JAMES H. BROWN. University of Chicago Press, Chicago, 1995. xiv, 269 pp., illus. $42.50 or £33.95; paper, $15.95 or £12.75.

When Robert MacArthur introduced the assembled students in his lectures on biogeography at Princeton in 1966 to the study of patterns in the number of species of plants and animals, I felt the thrill of bringing order to the bewildering variety that had drawn me to natural history in the first place. In his quiet yet deliberate manner, MacArthur showed how a broadly comparative approach coupled with the application of simple mathematical models could transform the ecological study of diversity from a mere cataloging of species and place names into the recognition of principles with explanatory power.

We have come a long way in our understanding of diversity since 1966, but the insights and enthusiasm that MacArthur imparted live on undiminished in Rosenzweig's wide-ranging treatise on the geography of diversity. In what may be the most important book on this subject since MacArthur's *Geographical Ecology* (Harper and Row, 1972), Rosenzweig combines theory with a huge body of empirical observations on terrestrial, aquatic, and marine organisms living today as well as in the geological past to produce a coherent account that brings together several previously separate research traditions ranging from experimental ecology to ecosystems analysis, paleontology, biogeography, and macroevolution. He not only reviews and summarizes the contribution of these fields but reanalyzes and reinterprets them, throughout emphasizing new approaches and new questions. Rosenzweig confronts the complexity of diversity directly, convincing the reader that a predictive understanding can come about only when we study the phenomenon at all scales of space and time. Why are there more species in the tropics than at higher latitudes? Why is polyploidy among plants more common on tropical mountaintops than in tropical lowlands, when in the temperate zones the proportions remain constant with altitude? Why are there so many rodents in earthquake-prone regions of the former Soviet Union, or so many plant species in the superficially monotonous South African fynbos or the southwest Australian kwongan heathlands?

More clearly than anyone else, Rosenzweig shows why we cannot employ small-scale patterns of diversity uncritically as models to explain larger scale patterns of diversity among biogeographical provinces and over geological time. When ecologists compare numbers of species among experimentally manipulated plots or even among islands in an archipelago, they are subsampling a known and relatively constant species pool. In comparisons among provinces, across latitudes, or over time, however, the pool of available species changes by virtue of such evolutionary processes as speciation, extinction, and large-scale invasion. Thus, although area emerges as the most important factor controlling diversity at all spatial scales of analysis, its precise relationship to species number differs strongly at the various scales. Productivity, or at least the access that organisms have to available energy and nutrients, is clearly also important, but here our understanding remains sketchy.

Brown's *Macroecology* covers some of the same ground but deals with a narrower range of scales—regional to global in space, decadal to millennial in time. With most of his data coming from the abundance, distribution, and sizes of North American mammals and birds, Brown's empirical base is much more limited than Rosenzweig's, and he runs the risk of wringing too much out of what may be a skewed sample of the biota. For example, given that nearly all large mammals and many large birds disappeared in North America at the end of the Pleistocene, how should we interpret the relationships among body size, abundance, and size of range that Brown documents for the living subsample of North American birds and mammals?

Nevertheless, Brown makes many important points that ecologists should ponder. Like Leigh Van Valen, whose important but often overlooked paper on energy (*Evol. Theory* **1**, 179–229 [1976]) he cites, Brown argues that energy should be adopted as the preferred currency of ecological and evolutionary studies. He also persuasively pleads for the use of a diversity of methods in comparative biology, not only those derived from cladistic analysis as some biogeographers would insist. Brown recognizes that geographical range limits are changeable, that a given geographical configuration and geological history do not affect all lineages in the same way, and that many explanations typically considered mutually exclusive are instead complementary.

Both books go far in bridging the enormous gulf that has existed for decades between Big Ecology—the analysis of energy flow and nutrient cycles in ecosystems—and Little Ecology, the experimental dissection of the effects of competition, predation, host-guest relationships, and physical factors on local patterns in the abundance

of species. Anyone who doubts that these two traditions can be merged, or that comparative biology has a great deal to contribute to the emerging science of diversity, should read these books.

Geerat J. Vermeij
Department of Geology and Center of Population Biology, University of California, Davis, CA 95616, USA

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Reprints of Books Previously Reviewed

Enrico Fermi, Physicist. Emilio Segrè. University of Chicago Press, Chicago, 1995. Paper, $13.95 or £11.25. *Reviewed* **169**, 846 (1970).

The Firecracker Boys. Dan O'Neill. St. Martin's Griffin, New York, 1995. Paper, $14.95 or $C21. *Reviewed* **266**, 663 (1994).

The Physics of Immortality. Frank J. Tipler. Anchor (Doubleday), New York, 1995. Paper, $14.95 or $C19.95. *Reviewed* **267**, 1042 (1995).

Unusual Telescopes. Peter Manly. Cambridge University Press, New York, 1995. Paper, $19.95. *Reviewed* **257**, 421 (1992).

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Books Received

Antibody Engineering Protocols. Sudhir Paul, Ed. Humana, Totowa, NJ, 1995. xii, 450 pp., illus. Spiralbound, $69.50. Methods in Molecular Biology, 51.

The Belle Epoque of Surgery. The Life and Times of Theodor Billroth. Karel B. Absolon. Kabel, Rockville, MD, 1995. 214 pp., illus., + plates. $49.50; paper, $39.50.

Biochemistry. Lubert Stryer. 4th ed. Freeman, New York, 1995. xxxvi, 1064 pp., illus. $69.95.

Bluebirds and Their Survival. Wayne H. Davis and Philippe Roca. University Press of Kentucky, Lexington, 1995. x, 154 pp., illus. Paper, $15.95.

Changing the Rules. Psychology in the Netherlands, 1900-1985. Trudy Dehue. Cambridge University Press, New York, 1995. x, 204 pp., illus. $49.95. Cambridge Studies in the History of Psychology. Translated from the Dutch edition (Amsterdam, 1990) by Michael O'Loughlin.

Chaos, Gaia, Eros. A Chaos Pioneer Uncovers the Three Great Streams of History. Ralph H. Abraham. HarperSanFrancisco, San Francisco, 1994. xvi, 263 pp., illus. Paper, $16.

Chemistry of Structure-Function Relationships in Cheese. Edyth L. Malin and Michael H. Tunick, Eds. Plenum, New York, 1995. x, 397 pp., illus. $95. Advances in Experimental Medicine and Biology, vol. 367. From a symposium, Chicago, IL, Aug. 1993.

Children of the Atomic Bomb. An American Physician's Memoir of Nagasaki, Hiroshima, and the Marshall Islands. James N. Yamazaki, with Louis B. Fleming. Duke University Press, Durham, NC, 1995. xvi, 184 pp., illus. $16.95. Asia-Pacific: Culture, Politics, and Society.

Cycles in Humans and Nature. An Annotated Bibliography. John T. Burns. Scarecrow, Metuchen, NJ, 1994. xii, 288 pp. $37.50. Magill Bibliographies.

The Encyclopedia of Advanced Materials. David Bloor *et al.*, Eds. Pergamon (Elsevier Science), Tarrytown, NY, 1994. 4 vols. lii, 3152 pp., illus. $1600.

An Encyclopedia of Claims, Frauds, and Hoaxes of the Occult and Supernatural. James Randi. St. Martin's, New York, 1995. xx, 284 pp., illus. $24.95.

Essential Substances. A Cultural History of Intoxicants in Society. Richard Rudgley. Kodansha Globe, New York, 1995. x, 197 pp., illus. Paper, $12. Reprint, 1994 ed.

Essentials of Psychology in Action. Karen Huffman, Mark Vernoy, and Judith Vernoy. Wiley, New York, 1994. xxx, 522 pp., illus., + supplementary material. Paper, $29.50.

Ethics on the Ark. Zoos, Animal Welfare, and Wildlife Conservation. Bryan G. Norton *et al.*, Eds. Smithsonian Institution Press, Washington, DC, 1995. xxviii, 330 pp., illus. $32.50. Zoo and Aquarium Biology and Conservation. From a workshop, Atlanta, March 1992.

The Evening Star. Venus Observed. Henry S. F. Cooper, Jr. Johns Hopkins University Press, Baltimore, 1994. xiv, 300 pp., illus. Paper, $12.95. Reprint, 1993 ed.

Global Environmental Change. Interactions of Science, Policy, and Politics in the United States. Robert G. Fleagle. Praeger, Westport, CT, 1994. xvi, 243 pp. $59.95.

A Global Geochemical Database. For Environmental and Resource Management. A. G. Darnley *et al.* UNESCO, Paris, 1995. x, 122 pp., illus. Paper. Earth Sciences, 19. Final Report of IGCP Project 259.

The Global Geospace Mission. C. T. Russell, Ed. Kluwer, Norwell, MA, 1995. viii, 877 pp., illus. $349 or £209 or Dfl. 495. Reprinted from *Space Science Reviews*, vol. 71, nos. 1-4, 1995.

Hochschild Cohomology of von Neumann Algebras. Allan M. Sinclair and Roger R. Smith. Cambridge University Press, New York, 1995. viii, 196 pp. Paper, $29.95. London Mathematical Society Lecture Note, 203.

Hormonal Regulation of Bone Mineral Metabolism. Daniel D. Bikle and Andres Negro-Vilar, Eds. Endocrine Society Press, Bethesda, MD, 1995. vi, 397 pp., illus. Paper, $60; to society members, $50. Endocrine Reviews Monographs, 4.

Hot Hadronic Matter. Theory and Experiment. Jean Letessier, Hans H. Gutbrod, and Johann Rafelski, Eds. Plenum, New York, 1995. xii, 562 pp., illus. $145. NATO ASI Series B, vol. 346.

Intercellular Signalling in the Mammary Gland. Colin J. Wilde, Malcolm Peaker, and Christopher H. Knight, Eds. Plenum, New York, 1995. xii, 296 pp., illus. $89.50. From a symposium, Ayr, UK, April 1994.

International Handbook of Personality and Intelligence. Donald H. Saklofske and Moshe Seidner, Eds. Plenum, New York, 1995. xxiv, 776 pp., illus. $95. Perspectives on Individual Differences.

International Tables for Crystallography. Vol. A, Space-Group Symmetry. Theo Hahn, Ed. 4th ed. Published for the International Union of Crystallography by Kluwer, Norwell, MA, 1995. xvi, 878 pp., illus. $180 or £120 or Dfl. 340.

Interstitium, Connective Tissue and Lymphatics. R. K. Reed *et al.*, Eds. Portland, London, 1995 (U.S. distributor, Ashgate, Brookfield, VT). xiv, 341 pp., illus. $120 or £75. Proceedings, 9. From a congress, Glasgow, UK, 1993.

Memory's Ghost. The Strange Tale of Mr. M. and the Nature of Memory. Philip J. Hilts. Simon and Schuster, New York, 1995. 253 pp. $22.

Microbiology and Immunology. An Illustrated Review with Questions and Explanations. David J. Hentges. 2nd ed. Little Brown, New York, 1995. xvi, 288 pp., illus. Paper, $27.95.

Modern Practice of Gas Chromatography. Robert L. Grob. 3rd ed. Wiley, New York, 1995. xiv, 888 pp., illus. $89.95.

Modern Synthetic Methods 1995. Beat Ernst and Christian Leumann, Eds. Verlag Helvetica Chimica Acta, Basel, Switzerland, and VCH, New York, 1995. x, 453 pp., illus. $80.

Modified Lipoproteins in the Pathogenesis of Atherosclerosis. Sampath Parthasarathy. Landes, Georgetown, TX, 1994 (distributor, CRC Press, Boca Raton, FL). x, 131 pp., illus. $89.95. Medical Intelligence Unit.

The Periodic Kingdom. A Journey into the Land of the Chemical Elements. P. W. Atkins. BasicBooks, New York, 1995. xii, 163 pp., illus. $20. Science Masters.

Personal Liberty and Community Safety. Pretrial Release in the Criminal Court. John S. Goldkamp *et al.* Plenum, New York, 1995. xxiv, 342 pp., illus. $45. Plenum Series in Crime and Justice.

Petroleum Sedimentology. Winifred Zimmerle. Kluwer, Norwell, MA, 1995. x, 413 pp., illus. $169 or £110 or Dfl. 260.

Photonic Crystals. Molding the Flow of Light. John D. Joannopoulos, Robert D. Meade, and Joshua N. Winn. Princeton University Press, Princeton, NJ, 1995. xii, 137 pp. $35 or £30.

The Physiology of Fungal Nutrition. D. H. Jennings. Cambridge University Press, New York, 1995. xvi, 622 pp., illus. $150.

Picturing Health and Illness. Images of Identity and Difference. Sander L. Gilman. Johns Hopkins University Press, Baltimore, 1995. 200 pp., illus. $32.95. Published in UK by Reaktion Books as *Health and Illness: Images of Difference*.

Population Management for Survival and Recovery. Analytical Methods and Strategies in Small Population Conservation. J. D. Ballou, M. Gilpin, and T. J. Foose, Eds. Columbia University Press, New York, 1995. xx, 375 pp., illus. Paper, $29.50 or £21. Methods and Cases in Conservation Science.

A Primer of Conservation Biology. Richard B. Primack. Sinauer, Sunderland, MA, 1995. x, 278 pp., illus. Paper, $18.95.

Principles of Biochemistry. Geoffrey L. Zubey, William W. Parson, and Dennis E. Vance. Brown, Dubuque, IA, 1995. xxxii, 864 pp., illus., + supplementary material. $80.11.

Principles of Plasma Discharges and Materials Processing. Michael A. Lieberman and Allan J. Lichtenberg. Wiley, New York, 1994. xxvi, 572 pp., illus. $54.95.

Quantum Measurement. Vladimir B. Braginsky and Farid Ya. Khalili. Cambridge University Press, New York, 1995. xviii, 193 pp. Paper, $24.95. Reprint, 1992 ed.

The Search for God. Can Science Help? John Houghton. Lion, Oxford, UK, 1995. 224 pp., illus. Paper, £6.99.

Sedimentographica. Photographic Atlas of Sedimentary Structures. Franco Ricci Lucchi. 2nd ed. Columbia University Press, New York, 1995. x, 255 pp., illus. $45 or £31.50. Translated from the Italian edition (Bologna, 1992).

Self-Motion. From Aristotle to Newton. Mary Louise Gill and James G. Lennox, Eds. Princeton University Press, Princeton, NJ, 1994. xxii, 367 pp. $45 or £36.50. Based on a conference, Pittsburgh, Feb. 1990.

The Seven Thunders of the Soul. A Unified General Theory of Behavior. Henry Jacobs. Trinity Research Center, Ashland, MS, 1995. vi, 162 pp., illus. Paper, $14.95.

Sexuality. A Developmental Approach to Problems. Betty N. Gordon and Carolyn S. Schroder. Plenum, New York, 1995. xviii, 157 pp. $35. Clinical Child Psychology Library.

The Shoulders of Giants. A History of Human Flight to 1919. Phil Scott. Addison-Wesley, Reading, MA, 1995. xiv, 337 pp., illus., + plates. $24.

Single-Channel Recording. Bert Sakmann and Erwin Neher, Eds. 2nd ed. Plenum, New York, 1995. xxiv, 700 pp., illus., + plates. $89.50.

The Social and Interactional Dimension of Human-Computer Interfaces. Peter J. Thomas, Ed. Cambridge University Press, New York, 1995. x, 268 pp., illus. $54.95. Cambridge Series on Human-Computer Interaction, 9.

Publishers' Addresses

Below is information about how to direct orders for books reviewed in this issue. A fuller list of addresses of publishers represented in *Science* appears in the issue of 26 May 1995, page 1220.

Cambridge University Press, 110 Midland Ave., Port Chester, NY 10573–4930. Phone: 800-872-7423; 916-937-9600. Fax: 914-937-4712.

Little, Brown and Co., 200 West St., Waltham, MA 02154. Phone: 800-759-0190; 617-890-2125. Fax: 617-890-0875.

University of Chicago Press, 11030 S. Langley Ave., Chicago, IL 60628. Phone: 800-621-2736; 312-568-1550. Fax: 800-621-8476; 312-660-2235.

Warner Books, P.O. Box 690, Special Sales Dept., 1217 Avenue of the Americas, New York, NY 10020. Phone: 800-222-6747; 212-522-6982. Fax: 800-222-6902.