understanding of the transformation of American science during the mid-20th century. In particular, he discusses how dramatic increases in patronage for science profoundly altered both the social organization of disciplines and the conduct of interdisciplinary research in the postwar period. Those who, like myself and, I suspect, Doel, see much that is admirable in little science with its transient interdisciplinary collaborations will marvel at the dispassionate acuity of his analysis of the transition to Big Science with its intense specialization and institutionalized multidisciplinary teams.

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Bats and Their Brains

Comparative Neurobiology in Chiroptera. GEORG BARON, HEINZ STEPHAN, and HEIKO D. FRAHM. Birkhäuser Boston, Cambridge, MA, 1996. In three volumes. Vol. 1, Macromorphology, Brain Structures, Tables and Atlases. Vol. 2, Brain Characteristics in Taxonomic Units. Vol. 3, Brain Characteristics in Functional Systems, Ecoethological Adaptation, Adaptive Radiation and Evolution. x, 1596 pp., illus. $285.

The ability of bats (Chiroptera) to fly and to orient by echolocation gives them unparalleled mobility at night, and they have exploited the opportunities this opens to them by radiating into many different nocturnal niches. The order Chiroptera consists of two suborders, 17 or 18 families, and over 900 species with a complex geographic distribution that reflects an evolutionary process heavily dependent on differentiation of patterns of behavior, thus making the brain and nervous system key sites for phylogenetic comparison. The flight of bats, their use of biosonar, often in conjunction with vision and passive hearing, for orientation, their diversity of social organization and communication, and their surprising diversity in all sorts of physiology (vampire bats are flying kidneys) combine to make them a living laboratory for illustrating the adaptability of the nervous system.

This three-volume work is at once an immensely valuable source book on the neurobiology and behavior of bats and a major conceptual contribution to comparative neuroscience through systematic examination of hypotheses concerning their adaptive radiation. The first volume examines structures and fiber connections in the brain, with material ranging from gross neuroanatomy to cytoarchitecture. This volume includes a vast data set—tabulations of morphological features of the brain in different groups of bats and an atlas of the brain in two species (*Rousettus amplexicaudatus*, *Myotis montivagus*). The breadth and depth of the review of literature underlying the data set and its cross-indexing by brain structure and taxonomic unit make this volume a monumental descriptive contribution, but it also deals

The common long-eared bat *Plecotus auritus* (Linné, 1758). [From the cover of *Comparative Neurobiology in Chiroptera*, vol. 3]

effectively with using the data to answer questions about brain size (encephalization) in relation to phylogeny. The second volume is an ambitious compilation of every conceivable aspect of neurobiology—gross and fine neuroanatomy, neurophysiology, histology, histochemistry, and behavior—in different groups of bats. At its most detailed level, this volume essentially describes what is known about the habitat, habits, behavior, sensory capacities, and brain organization in different species of bats—and there are a lot of them. Comparisons of brain size begun in the first volume are carried in the second volume to the level of numerous specific brain structures in different families, genera, and species. The third volume is an equally ambitious examination of the same wide range of material reorganized in terms of functional neural systems. Details of sensory, motor, limbic, and neocortical systems are examined in relation to ecology, behavior, and adaptive radiation as represented by phylogenetic relations.

Taken together, these three volumes raise a wide range of different types of questions about the organization and evolution of the brain, answer many of them, and generally glean from our present knowledge a program of enquiry to answer yet more. The work exhibits a level of scholarship that I expect will not soon be equaled in neuroscience, and I hope that neuroscientists working with the "mainstream" animals—chiefly primates, cats, and rats—will discover the surprises these authors have handed to them in one source.

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Applied Population Ecology. A Supply-Demand Approach. Andrew Paul Gutierrez. Wiley, New York, 1996. xviii, 300 pp., illus. $69.95.

Archaeological Chemistry. A. Mark Pollard and Carl Heron. Royal Society of Chemistry, Letchworth, Herts, UK, 1996 (U.S. distributor, CRC, Boca Raton, FL). xvi, 375 pp., illus. Paper, $39 or £322.50.

Archaeology. Theories Method and Practice. Colin Renfrew and Paul Bahn. 2nd ed. Thames and Hudson, New York, 1996 (distributor, Norton, New York). 608 pp., illus. $45.

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