REVIEWS


This work is essentially a festschrift for The American Society of Mammalogists, written by 41 members, on the occasion of its 75th birthday. It is really two books. Part I is entitled History of the ASM and Its Most Prominent Members (8 chapters, 177 pages). Society Historian Donald Hoffmeister and Keir Stirling lead off this part with a review of the origin of the Society, dealing first with the beginnings of scientific societies in general, then with early mammalogy in North America, and finally with the formation of the ASM by a group of biologists from the United States Biological Survey, chief among whom was Hartley H. T. Jackson.

James Layne and Robert Hoffmann review the presidents of the Society, 38 in number at the time of their writing. The first part of this chapter consists of an attempt at a presidential profile, summarizing such things as age at joining ASM (mean 23 years), longevity (mean lifespan 76 years), number of children (mean 2.7), military service, educational background, and so on. Most of the chapter is taken up with biographical sketches of the presidents together with their photographs.

Mary Taylor and Duane Schlitter provide a summary of those individuals who have received the awards the ASM offers: Honorary Membership, the C. Hart Merriam Award, and the H. H. T. Jackson Award. Biographical sketches and photographs of these awardees are presented. Seventy-six individuals have been honored in this way by the Society, including 20 citizens of countries other than the United States.

David Armstrong, Murray Johnson, and Randolph Peterson discuss other prominent members, individuals who have been important in the development of mammalogy, but have not received societal awards or served as president. These people are categorized by the decade in which they made their major contributions. The authors of this chapter agonized over their mission. Peterson initially submitted a list of 76 names, but passed away before the chapter was written. The others, noting their biases and weaknesses, ended by identifying 34 individuals while admitting that the selection could hardly be more than a representative sampling of important mammalogists.

A phylogeny of American mammalogists, in a chapter entitled Academic Propinquity, is presented by John Whitaker. Surely one of the topics often discussed at mammal meetings is academic genealogy. "Who was your major professor?, where did he get his degree?," and so on. Knox Jones first addressed these questions for systematic mammalogists in 1985 tracing part of the lineage emanating from Joseph Grinnell (Jones, 1991). Whitaker has done a fascinating job of expanding on this idea including also the intellectual descendants of the Biological Survey Group (C. Hart Merriam), the Harvard Group (Louis Agassiz and Glover Allen), and the Cornell Group (W. J. Hamilton, Jr.), and also has attempted to bring in lineages beginning in related fields such as ecology, genetics, ethology, conservation and wildlife biology, anatomy, ornithology, and others. It must be satisfying to be able to place one's self in this distinguished matrix. In this satisfaction mammalogists seem to display affinities with another taxon of beings, of uncertain provenience, described many years ago in part as follows:

"All Hobbits were, in any case, clannish and reckoned up their relationships with great care. They drew long and elaborate family trees with innumerable branches. In dealing with Hobbits it is important to remember who is related to whom, and in what degree." (Tolkien, 1966).

B. J. Verts and Elmer Birney describe the publications of the Society, the Journal of Mammalogy, Mammalian Species, the Monographs, and the Special Publications. Three Monographs were published, the last in 1928. The institution of the Special Publications series with The Natural history and behavior of the California sea lion by Peterson and Bartholomew in 1967 came about because of agreement by the Directors that a continuation of the monographs, but with a somewhat different focus, was desirable. Eleven Special Publications have been issued, the last
being the volume under review. Most of this chapter consists of a detailed history and analysis of the Journal of Mammalogy, including analyses of size and content over the years, as well as a useful tabulation of the editors and other members of the editorial staff.

Ayesha Gill and Chris Wozencraft give a history of ASM committees and of the annual meetings. The latter are analyzed from the standpoint of number of papers given, their content, the role of women and minorities in the meetings, their geographic distribution, and other trends. Helpful here would have been a tabulation of meeting sites, perhaps including institutional and individual hosts. The history of committees is especially useful in demonstrating changing interests and emphases of the Society.

The final chapter of this section, Membership and Finance by Gordon Kirkland and Duane Smith, although brief, is a goldmine of statistical information and analysis of membership, and especially the financial status of the Society over its history. Members should pay careful attention to the description of the Reserve Fund and its history. Established with the original By-laws and Rules in 1919 to subsidize various functions of the Society, the fund has been managed since 1923 by the Trustees elected by the Directors. The J. A. Allen Memorial Committee directed a fund drive to raise $10,000 beginning in 1922, and that goal was attained in 1929. Since then, through the wisdom of the Trustees, the fund has approximately doubled each decade, and in 1990 stood at $800,000. Much of the ability of the Society to maintain its publication program results from annual transfers of income from the General Fund to the general operating account. Few societies of our size are as affluent or as well-managed financially.

This section is indeed a source-book of information on the Society. It will be useful not only to members seeking to answer questions, but to officers and directors seeking to better understand the historical context within which they are endeavoring to guide the Society into the future.

Part II is entitled Intellectual Development of the Science of Mammalogy (13 chapters, 254 pages). Mark Engstrom, Jerry Choate, and Hugh Genoways lead off with a review of taxonomy, appropriately, because the ASM was founded by taxonomists, and that group has had a large influence on the Society over the years. A historical overview is followed by discussions of the role of mammalogy in the evolution of the species and subspecies concepts. In the latter category, the contributions of mammalogists have ranged from those of Lidicker, who formulated a much-cited definition, that of Hall and Kelson, whose recognition of 213 subspecies of Thomomys umbrinus elicited caustic commentary from G. G. Simpson. The involvement of mammalogists with the modern fields of cladistics and phenetics and a discussion of the development of the modern classification of mammals completes this section.

Richard Zakrewski and Jason Lillegraven present paleomammalogy. Along with hard-shelled invertebrates and reptiles, fossil mammals provide some of the most important material for the paleontologist. For understanding the terrestrial Cenozoic, probably no other group of animals is as important. Thus, paleomammalogists always have made substantial contributions to the structure of historical geologic concepts. Fossil mammal material has been used extensively in the development of basic evolutionary concepts involving tempo and mode of evolution, punctuated equilibria, and the nature of extinction.

Syd Anderson and Bruce Patterson give a good historical review of biogeography, another of the core areas of mammalogy. Mammalogists have been involved with the development of biogeography since its early days, and the authors cite mammalian contributions (including important ones of their own) since the founding of the Society to our understanding of distributional changes of species and biotas over ecological and evolutionary time periods.

Carelton Phillips treats anatomy in the context of American mammalogy. This limitation is necessary because of the huge size of the field; some 80 journals carry papers on mammalian anatomy. Phillips presents an unusually penetrating historical analysis. He notes the early existence of three main areas: medical school anatomy; practiced in the American medical school environment; zoological morphology, practiced by academic morphologists or experimental zoologists; mammalogical anatomy, practiced by museum-based systematic mammalogists. Much high-quality anatomy appears in the pages of the Journal of Mammalogy, and Phillips notes that it may be "the single best source of information about integumentary glands in mammals."
distinctive mark of modern mammalian anatomy is that it is comparative and integrative, in contrast to that practiced in other areas mentioned.

Bruce Wunder and Gregory Florant review physiology by decade since 1919, considering that which has appeared in the Journal of Mammalogy, as well as in other sources. Interesting histograms compare coverage of various physiological subjects in Annual Review of Physiology, Physiological Zoology, and the Journal of Mammalogy for the decades of the 1960s, 1970s, and 1980s. These reveal the distinctive concentration by mammalogists in temperature regulation, energetics, water balance, reproduction, and digestion-nutrition, fields related to physiological ecology, adaptation, and population dynamics.

A broad survey of mammalian reproduction is provided by Oliver Pearson and G. J. Kenagy. Study of the Journal of Mammalogy shows a surge in papers on reproduction following World War II, to 10–14% of articles published. Several “legacies” are identified as seminal in early 20th-century reproductive studies; the Cambridge Legacy, the Johns Hopkins Legacy, the Carnegie Institution, and lesser centers at Cornell, Wisconsin, the Division of Fur Resources at the United States Department of Agriculture, and Swarthmore. Late 20th-century developments are treated under such headings as neuroendocrinology, molecular biology, environmental physiology, energy expenditure, offspring, and behavior. New findings in marsupial reproduction and new reproductive technologies wind up this section. Citing the newly discovered case of simultaneous lactation and spermatogenesis by male fruit bats of the Malaysian species Dyacopterus spadiceus, the authors express their confidence that natural history will continue to surprise the student of mammalian reproduction.

Systematics, the central discipline in the earlier ASM, continues to attract a strong corps of investigators. These modern systematists, however, in all likelihood combine skill in the use of electrophoretic apparatus and the techniques of DNA hybridization with the proficient use of the Museum Special and the Sherman livetrap. The resulting field of molecular systematics is reviewed by two of its practitioners Rodney Honeycutt and Terry Yates. The history of this subdiscipline is rather brief, and the first section of the review deals with the development and use of molecular techniques. The contribution of molecular systematic studies of mammals has been important in the debate on the theory of selective neutrality, and in the development of the molecular clock. The use of molecular systematic data coupled with cladistic methods is making, and promises to continue to make, important contributions to evolutionary, biogeographic, and population biology theory. This chapter on molecular systematics is a good short course for readers unfamiliar with the subject.

“Pertaining to mammalogy cytogenetics is a synonym for karyology, chromosomal evolution, or chromosomal biology” according to reviewers Robert Baker and Mark Hafner. As with anatomy, the volume of current research makes this limitation necessary. In 1992 alone, nearly 7,000 papers on cytogenetics appeared in 627 journals. Thus restricted, cytogenetics is reviewed with a concentration on articles appearing in the Journal of Mammalogy. Following a summary of historical development and technological advances of the field in general, its development in the pages of the Journal of Mammalogy is treated. From virtually no papers prior to 1970, the number per year rose to a peak of 30 in 1980 and has since declined. Much of the early publication involved descriptions of karyotypes of wild mammals, mostly of rodents and bats. The authors attribute the recent decline in cytogenetics papers in the Journal of Mammalogy to the advent of improved methods for molecular systematics.

William Lidicker provides a thoughtful and critical history of population ecology, a field in which he has played an important part. His focus is on the contributions of population ecology to the development of molecular systematic studies of mammals which have influenced population ecology, and the ways in which developments in ecology have affected mammalogy, with a concentration on North American mammalogy. Lidicker's essay is organized as a tree, into roots (historical underpinnings), the trunk (early research on population processes), branches (modern foci in the field), and buds (future perspectives). Throughout, the names of mammalogists appear along with the names of many workers who, although not primarily thought of as mammalogists, have done their major work with mammals. A feature of Lidicker’s chapter, which I believe typifies the best in mammalogical thinking, is his attention and sensitivity to levels of organization in biology, and the importance of emergent phenomena
and of a holistic approach in understanding the living world. Indeed, a tendency not to be totally overwhelmed with reductionist science seems to characterize many workers whose focus is the living animal in its populational, community, and ecosystem context. This chapter would make an exceptionally good introduction to the field of population ecology for beginning graduate students.

Community and ecosystem ecology are the province of Michael Marus and Guy Cameron. As with the previous chapter, they concentrate on the extent to which mammalogy has influenced and been influenced by developments in the conceptual areas with which the authors are charged. A history of the early development of the fields leads into the early contributions of mammalogists, Merriam and Grinnell being noted as contributors to ideas on communities and ecosystems. Early ecologists who are not usually thought of first as mammalogists were often members of the ASM, for example Victor Shelford and Charles Elton. The niche concept was probably the brainchild of Joseph Grinnell, who also described competitive displacement. Processes such as predation and mutualism, and community structure and patterns have been elucidated by mammalogists. At the ecosystem level, Frank Colley and Frank Blair are among those who have played prominent parts.

James Brown and Don Wilson trace the development of natural history into evolutionary ecology. Among the charter members of the ASM were some of the country's leading natural historians. The discovery phase of natural history included such pre-ASM mammalogists as Baird, MeArm, and Coues. Merriam's work in assembling the legendary staff of naturalists for the Division of Economic Ornithology and Mammalogy was chiefly responsible for the rapid advance of mammalogical knowledge early in this century. By the 1930s, as ecology and evolution were entering a new theoretical phase marked by a synthesis of genetics and systematics, mammalogists such as Dice, Sumner, and Simpson contributed heavily to this development. Mammalian natural historians and systematists were most productive in the first half of this century, and many of them produced students who contributed to the emergence of modern evolutionary ecology.

Behavior is the province of John Eisenberg and Jerry Wolff. First they treat the history of behavior studies prior to 1965, noting that most early mammalogists studied behavior with varying levels of intensity, and that mammalian physiologists and behaviorists interacted productively. In 1969, a Smithsonian conference on Man and Beast focused attention on the likelihood that some aspects of human behavior had a genetic basis, and stimulated E. O. Wilson's production of Sociobiology. The subsequent influence of scientists at the American Museum of Natural History, The University of Chicago, Yale University, the Smithsonian Institution, and the University of California on the production of students of behavior are reviewed. The ASM became increasingly involved as marked, for example, by Special Publication No. 7, Advances in the Study of Mammalian Behavior edited by Eisenberg and Kleiman in 1983. Finally the contribution of mammalian studies to questions involving levels of selection, parental investment, sex-ratio adjustment, evolutionarily stable strategies, optimization theory, sex-biased natal dispersal, mating systems, and infanticide are reviewed. Students of mammals have been involved, centrally or peripherally, in the entire development of behavioral knowledge and theory from the individual to the population level.

A final chapter on conservation and management by James Shaw and David Schmidly is essentially a much condensed introductory course on the subject with an emphasis on mammals and some emphasis on North America. The ASM has figured importantly in the history of wildlife management in this country in serving as an arena for a long-term series of debates on the subject of government-sponsored predator control.

As I began reading this section, I pondered several basic conceptual questions. Taxon-oriented societies such as the ASM were begun by taxonomists concerned chiefly with the systematics and distribution of their organisms of interest. As this emphasis has waned over the years, and as investigators have increasingly focused on conceptual areas such as ecology, evolution, and behavior, what role is left for the traditional mammalogist? Indeed, what is a modern mammalogist? And, is it not somehow pretentious or even gratuitous for a bunch of ASM members to be discussing the history of such broad conceptual areas as population ecology and physiology within the confines of the field of mammalogy? After all, these disciplines are
represented by large, active societies populated by cadres of distinguished specialists, surely eminently qualified to review the histories of their fields. However, as I read through the chapters in Part II, I experienced a growing sense that I was being treated by my colleagues to an amazing overview of much of modern holistic biology. The extent to which mammalogists, indeed many of the authors of the chapters in this section, have contributed in major ways to advances and conceptual breakthroughs in other fields, began to come clear. Many mammalogists are distinguished leaders in other fields, and yet they still are, and consider themselves to be, mammalogists. What are mammalogists? They are scientists who, through their fascination with one group of organisms, and through their broad academic backgrounds, have managed to focus and integrate diverse modern conceptual areas of biology to produce emergent insights into the structure and functioning of nature. It is not pretentious for a mammalogist to review physiology or behavior; few other kinds of scientists could do it with as much sensitivity to the larger whole of which these fields are a part. On completing this reading, I felt as though I had reviewed much of the exciting biological science that has happened during my lifetime. My enthusiasm is such that I would recommend Part II of this book to doctoral students studying for the comprehensive exam.

I began reading Seventy-five Years with a certain apprehension and a certain dread of having to plow through material much of which I feared would be tedious. I ended feeling elated to be a member of the ASM, and in the company of scientists who have done so much to pull together modern biology and to use it to increase our understanding and appreciation of the living world. In years past, I used to jokingly bait colleagues in the Department of Biology at the University of New Mexico with a slogan that I now believe to be absolutely true: "If you want the job done right, hire a mammalogist!"

Assembling and editing this massive publication was clearly a major effort, and the editors are to be thanked and congratulated for their contribution to history and to scholarship. Coordinating the work of 41 independent mammalogists certainly must have required skills comparable to those needed to chair the General Assembly of the United Nations. This work is a must for all mammalogists, will be useful for historians of science, and provides a valuable overview for evolutionary and environmental biologists, and field biologists generally.—JAMES S. FINDLEY, Museum of Southwestern Biology, Department of Biology, University of New Mexico, Albuquerque, NM 87131.

LITERATURE CITED


The controversial objectives of Easteal et al. are spelled out clearly in the introduction of their monograph. They intend to argue for a universal mammalian molecular clock (which ticks at a constant rate for nearly all nonrepetitive DNA) and for the application of this clock in dating mammalian divergences. Further, when the dates calculated using a constant rate of nucleotide substitution disagree with conventional wisdom about mammalian evolution based on paleontological evidence, the latter should be reassessed, if not rejected outright. Results that emerge by using their molecular dating include a divergence of 3.6–4 × 10⁶ years ago for Homo-Pan (implying bipedalism as an ancestral trait for both species), a Jurassic or even Triassic divergence for metatherians and eutherians, and the major eutherian radiations predating the end-Cretaceous extinction event by 10s of millions of years. These heretical ideas may be enough for some readers not to take this work seriously, but this book should not be dismissed outright. The credibility of the authors and the development of their arguments warrant close attention by mammalian systematists and paleontologists.

The book is not intended to be a thorough review of molecular evolution or mammalian phylogeny. Rather, the argument for the con-