

Familiar Birds

Blackbirds of the Americas. GORDON H. ORIAN. With drawings by Tony Angell. University of Washington Press, Seattle, 1985. 163 pp., illus. \$24.95.

The blackbirds of the subfamily Icterinae have attracted more scientific and public attention than any other American songbirds. Blackbirds abound in a wide variety of habitats and show remarkably diverse foraging tactics, diets, social organizations, and vocalizations. Few birds have adapted so well to mankind's modifications of the landscape. Familiar grackles, cowbirds, and red-winged blackbirds gather in roosts numbering in the millions and at times become serious crop pests. In Central and South America, colonial caciques and oropendolas are among the most conspicuous birds of tropical lowlands. Cowbirds, which lay their eggs in the nests of over 400 other species, have been the subject of particularly intensive study both because they pose a serious threat to the continued existence of many of their host species and because they provide evolutionary biologists with extraordinary examples of coevolution. In addition to these conspicuous and abundant species are the less gregarious and more aesthetically appealing orioles, meadowlarks, and bobolinks. The richness and variety of their adaptations makes blackbirds ideal for comparative studies.

In *Blackbirds of the Americas*, Gordon Orians broadly surveys the major adaptations of blackbirds and discusses the current state of blackbird research. Orians writes in an informal style designed to be understood by the layperson. Each chapter addresses a general topic such as the role of the sexes (chapter 8) or communication (chapter 9) and draws on examples from the blackbird literature. Most chapters contain brief explanations of the basic theories underlying behavioral ecology and evolution. There are no species-by-species accounts, but most species are illustrated, and a useful appendix summarizes what is known about the habitat use, diet, plumage, and social organization of each of the 94 species. The result of this approach is a book that is primarily useful for the general public but that also contains material of interest to the specialist.

Throughout the text, Orians draws on the vast experience he has gained during nearly 25 years of studying blackbirds from Canada to Argentina. The first two chapters treat the evolutionary radiation of blackbirds. Orians argues convincingly that the key adaptation of blackbirds is their ability to gape, that is, to open their bills forcibly against resistance. Chapter 2 describes the

surprising number of ways blackbirds use gaping when foraging. Chapters 3 through 8 summarize the relationships among foraging, resource distribution, sociality, breeding behavior, and mating systems. Orians and his students have made many seminal contributions to the literature on these subjects through studies of marsh-nesting blackbirds. Some of the theoretical models presented in this set of chapters may be too advanced for a general audience, but on the whole the material is clearly explained. Chapters 9 through 11 are devoted to communication and coloration. These chapters include much speculation, largely because so little is known about these topics. The final chapter of the book is a highly personal account of the aesthetics of blackbirds and of their value to humans.

Nearly half of the space in the book is devoted to line drawings by Tony Angell. These drawings effectively illustrate many key plumage and behavior patterns and thus provide a useful accompaniment to the text. The drawings do not, however, stand well on their own. There are many errors in the proportions of birds, tail shape, and plumage, but these flaws should not detract from the usefulness of these illustrations to a general audience.

Orians several times refers to this book as a progress report rather than the final word on the subject. Throughout the text, he emphasizes the tentative nature of some conclusions and the ambiguity of many results from field studies. There have been too few long-term studies of marked populations of blackbirds, especially in the tropics, where the majority of species live. *Blackbirds of the Americas* sets the stage for and even anticipates the results of the next generation of blackbird studies.

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Museum Life

The National Museum of Natural History. 75 Years in the Natural History Building. ELLIS L. YOCHELSON. Mary Jarrett, Ed. Published for the National Museum of Natural History by the Smithsonian Institution Press, Washington, DC, 1985. 216 pp., illus. Paper, \$17.95.

Anyone familiar with museums knows that much more is to be seen behind the scenes than in the public exhibits. The average visitor seldom is aware of the extent of the stored collections not on display or understands that the primary concern of the staff is to add to the sum of human knowl-

edge by study of the objects assembled in the collections. Yochelson's account of the Smithsonian Institution's Museum of Natural History provides fascinating glimpses into the varied activities, contents, problems, and objectives of a large museum and the personalities of the staff who make it function. In addition, this book gives an excellent feeling for the variety and complexity of the supporting facilities—shops, exhibit preparation areas, education department, library, specialized laboratories, computers, auditorium—not to speak of the all-important collection storage and specimen records. The need for a bathtub in the director's office and many other surprising facts are explained and illustrated.

From its beginning in 1846 the Smithsonian Institution was charged with custody of all objects of art and of natural history belonging to the United States government. These collections were at first kept in the original Smithsonian building ("the castle"), where they soon outgrew the available space. In 1881 the first United States National Museum (now the Arts and Industries Building) opened, and the natural history building followed in 1910. From its opening until well into the 1960's, natural history materials shared the building with portions of the national art collections. In more recent years the Smithsonian has acquired an imposing complex of art galleries and museums, including a large Museum Support Center in Maryland.

It seems astonishing that construction of the natural history museum was started well before the final plans were developed and that these plans were changed repeatedly during the construction. The east and west wings, authorized in 1930, were not constructed until 1961–65. The original exhibits, installed soon after the building was erected, remained with little change for many years. Major new exhibits in the 1950's and again in the late 1970's each brought new concepts and techniques. The changing goals and methods in museum curation and exhibition are well documented.

Two outstanding features of this history are its emphasis on people and their achievements and the abundance of fine illustrations. It is a highly readable humanistic account of the programs and vicissitudes, problems and frustrations, successes and triumphs of a major cultural center. Succinct biographical sketches of the directors and many of the curators are enlivened by amusing anecdotes that reveal the personalities and idiosyncrasies of these living inhabitants of the museum. Supporting staff receives due attention. Readers unfamiliar with the museum will be surprised to learn that a



The National Museum of Natural History's taxidermy shop around 1957. Left to right, Charles R. W. Aschemeier, Watson M. Perrygo (partially hidden between two wolves), and William Goodloe. [From *The National Museum of Natural History*]

substantial part of the scientific staff are not employees of the museum or even of the Smithsonian Institution, but of other government bureaus—such as the U.S. Geological Survey, with which the author was affiliated.

Many features of the museum's history are typical of large museums—the crowding and consequent competition for space, crash programs to meet exhibit deadlines, insufficiency of funds, extensive reliance on volun-

teers, and the tradition of staff members continuing their work after retirement. Examples of all these are provided. The author's long familiarity with the museum and its traditions have enabled him to produce an unusually interesting history of this important institution.

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The Hubbard Brook Ecosystem

An Ecosystem Approach to Aquatic Ecology. Mirror Lake and Its Environment. GENE E. LIKENS, Ed. Springer-Verlag, New York, 1985. xiv, 516 pp., illus. \$49.

Hubbard Brook flows through a second-growth, hardwood forest in the mountains of north central New Hampshire; one of its tributaries drains Mirror Lake. In 1963 G. E. Likens and F. H. Borman, in cooperation with the U.S. Forest Service, began a detailed study of the biogeochemistry and ecology of the forest and associated aquatic ecosystems in the Hubbard Brook Valley. Their ongoing measurements of the chemical composition of atmospheric deposition and stream water are the longest such continuous records available in North America.

Their experimental manipulations of headwater drainages are paradigms for ecosystem analysis. Mirror Lake, though not suitable for manipulation as a whole system or studied continuously for two decades, provided Likens and his talented students an opportunity to address fundamental limnological questions and to compare and combine results from the terrestrial and lotic ecosystems with those from a lacustrine environment in the same watershed. Furthermore, the sediments of Mirror Lake record the climatic and ecological conditions in the Hubbard Brook Valley for the last 14,000 years, which permits the modern research to be put in a temporal perspective.

This book opens with a scholarly introduction by Likens and Borman to the analy-

sis of ecosystems in general and of Mirror Lake in particular. They emphasize that the lake must be examined in the context of its modern watershed and airshed and its history. The second, third, and seventh chapters are detailed accounts of climate and biogeochemistry of the Hubbard Brook Valley and of the paleoecology of the lake and its watershed. Hydrologic and solute data collected over two decades provide a rare and illuminating example of long-term trends and temporal variability. The rigorous determination of sedimentation in the lake and the use of a full complement of microfossils (diatoms, chrysophytes, cladocera, and pollen) and chemicals (pigments, organics, and metals) provide a superb illustration of how a watershed's history is deduced.

The core of the book is a remarkably comprehensive treatment of Mirror Lake's physics, chemistry, and biology (chapters 4 and 5). Taxonomic composition, abundance, and productivity are summarized for bacteria, phytoplankton, periphyton, zooplankton, aquatic macrophytes and vertebrates, and zoobenthos; only protozoans and fungi are not included. Though synthesis is offered as an input-output budget of organic carbon and as a carbon cycle within the lake, Likens prudently states that we are still far from a complete quantitative understanding of the sources and metabolism of organic carbon in lakes. Perhaps this awareness has deterred him from attempting a simulation model of Mirror Lake and will be a warning to others that such models may be premature for most ecosystems.

Air-land-water interactions and air and watershed management are dealt with in chapters 8 and 9.

Less satisfying than other parts of the book is the treatment of ecologic interactions in chapter 6. Most ecosystem analyses lack the experimental studies required to determine cause-and-effect relationships among species rigorously. With the solid descriptive biological foundation now available for Mirror Lake one hopes that future research will attempt to tie ecosystem processes to populations and therefore to help bridge a schism in modern ecology.

It is worth mentioning a few topics that have been omitted in hopes that they will be considered in the continuing research at Mirror Lake. Physical processes such as advective and dispersive currents, eddy diffusion, and boundary layer shear are pertinent to ecological processes such as nutrient supply, photosynthetic rates, zooplankton feeding, and sediment resuspension. And microbes play a basic role in nutrient regeneration and as a source of methane, sulfide, or nitrous oxide.