

## ORNITHOLOGICAL LITERATURE

**RESTLESS ENERGY—A BIOGRAPHY OF WILLIAM ROWAN.** By Marianne G. Ainley, Véhicule Press, Montréal, Canada. 1993:368 pp., colored cover, 22 illustrations including black-and-white photographs, manuscript pages, and art work. \$19.95.—Over the years when I lectured in ecology and ornithology classes about the effect of light on birds, I would mention “someone’s” experiments exposing juncos in Canada to increasing lengths of artificial daylight in autumn to see if the birds would fly north. Both I—and presumably the students—viewed this as (1) a clever endeavor and (2) worthy of a chuckle. But did some scientist really try this? Or was it only apocryphal? In the pages of “Restless Energy” came the revelation, not only about this but many other of my lecture topics, as the life work of the remarkable European-born Canadian biologist William Rowan unfolded.

The lad of ten (in 1901) who carried, in a tea infusion ball, “migrating French flies to England” would proceed, over his lifetime (he died in 1957), to do classical studies on the mechanism of migration, the effect of light duration on juncos, crows, and other species, light and seasonal reproduction in animals, the role of hormones in bird behavior, wildlife population cycles (it was Rowan who originally proposed the famous snowshoe hare/lynx research), and ecological studies of waterfowl and other vertebrates.

Biographer Ainley was aware of these accomplishments through her work on a history of Canadian ornithology. But was there more to this Rowan than met the scholarly eye—a life worthy of a biography? From letters, diaries, interviews, and junkets, there emerged the framework for “Restless Energy,” the reflections on a man who not only did imaginative research in field and laboratory but taught biology, shaped Canadian zoology departments, sketched and painted (his art became collectors’ items), wrote scientifically and popularly and provided a voice for nature on the new medium of radio, vexed over endangered species and promoted the idea of wildlife refuges, led field excursions, gave public lectures, became involved in later life with social issues, concern for the environment, and world overpopulation, throughout his career inspired students who would become important in their own right, and even received permission to shoot starlings from the roof of the National Gallery in downtown London. Sadly enough, his wife and growing family increasingly faded into the background of this busy man.

In seventeen chapters, Marianne Ainley takes Rowan from his beginnings (Chapter 1: “The Lap of Luxury, 1891–1908”) to his finale (Chapter 17: “Science, War, and Ethics: a Biologist Looks Forward”), with a retrospective epilogue. The selection of illustrations portrays his family, the scientist himself over his life span, historic research events (such as the “airliners” for crows) and manuscripts, and some of Rowan’s own delightful artistry. Indeed, the frontispiece is his sketch of Slate-colored Juncos, but personally I would have preferred, facing the title page, Rowan’s 1916 self-portrait, out in the field relaxing on a folding stool, in knee pants, knee socks, and tie, collecting gun in hand, a cigarette between two fingers, and sketch pad and pencil on the ground nearby. Incidentally, included with Ainley’s biography are extensive footnotes, Rowan’s own lengthy bibliography, and publications about him.

Was it the Canadian border that kept me from ever mentioning Rowan in class? We must indeed be provincial, because I don’t remember ever having noted him. It surprised me, then, to discover how widely known he was, a compatriot of Charles Elton, Allan Brooks, Ernest Thompson Seton, Joseph Grinnell, W. C. Allee, Julian Huxley, A. C. Bent, Thomas Barbour, Francis Harper, Percy Taverner, the Hamerstroms, Konrad Lorenz, Niko Tinbergen, Albert Wolfson, and Donald Farner, to drop some names. Surely there haven’t been many other professional ornithologists who were highlighted in “True” magazine.

Rowan's was, indeed, an energetic life, though restless and not always happy. Ainley has provided the full spectrum, some interesting, some dull, from excitement with innovative research and the relaxation of a wilderness excursion to administrative and personal conflicts and depression over the state of the world. Now that I know this indefatigable field man, I warm to Thornton Burgess' toast delivered at the 1931 Metamek Conference on wildlife cycles: "May Rowan's birthdays attain their peak only when all the crows fly north." I'm glad I never told my classes that the juncos indeed flew north, seeking an eternal spring in the fall. For in actuality they never did, though Rowan must secretly have hoped they would.—  
RICHARD G. BEIDLEMAN.

THE BIRDS OF AFRICA. Volume IV. Stuart Keith, Emil K. Urban, and C. Hilary Fry. Color plates by Martin Woodcock; line drawings by Ian Willis. Acoustic references by Claude Chappuis. Academic Press, London. 1992:609 pp., 32 color plates, two black-and-white plates, 359 range maps, and numerous line drawings. \$145.00.—What began in the late 1970s as a labor of love by several devoted ornithologists with deep interests in African birds has since expanded into a research and writing project of greater magnitude than they had planned. Originally projected as a four volume treatise on Africa's avifauna, it has now expanded to seven. Volume IV is devoted to passerines, as will be the final three.

The authors had earlier assumed that more is known about Africa's large birds (approximately 800 species) than its passerines (roughly 1200 species). This proved not to be the case since their research revealed that the body of knowledge of African passerines is greater than they had supposed. It was this discovery which will require additional volumes to cover Passeriformes comprehensively.

To recap this enormous project: Volume I (Leslie H. Brown, Emil K. Urban, and Kenneth Newman), 1982, covers Struthioniformes to Falconiformes with an excellent introductory chapter on Africa's geological past, climate, ecosystems, habitats, bird migration, and research; Volume II (Emil K. Urban, C. Hilary Fry, and Stuart Keith), 1986, covers Galliformes through Columbiformes; Volume III (Fry, Keith, Urban), 1988, Psittaciformes through Piciformes; and Volume IV (Keith, Urban, and Fry), 1992, Passeriformes, including broad-bills, pittas, larks, swallows, martins, wagtails, pipits, longclaws, cuckoo-shrikes, bulbuls, waxwings, Gray Hypocolius (*Hypocolius ampelinus*), silky flycatchers, dippers, wrens, accentors, and thrushes. Keith, Urban, and Fry have edited volumes II-IV with rotating senior editorship, a policy which is to continue through completion of the project.

Volume IV contains approximately 300 species accounts, as will each of the remaining three volumes. Individual accounts have been lengthened from 750 words to 1000 words, in most part due to expanded knowledge of Africa's birds. In addition to scientific names, common English and French names are provided and indexed for each species. Much of north and west Africa is Francophone, and while the text is not in French, this feature provides an element of accuracy in location of species for French-speaking readers. A spot-check of the extensive index of scientific, French, and English names turned up no errors.

The text is beautifully formatted. Although it is written partly in telegraphic fashion, it nevertheless is easy to read and reference. A comprehensive bibliography is structured in three sections: general and regional references, taxonomic family references, and acoustic references. The second section distills the salient literature for each family dealt with in Volume IV. Assembling this bibliography from the African region is no mean feat in itself.

Martin Woodcock's color plates are superb. They are more true-to-life when compared to earlier efforts of Volumes I and II. All color illustrations are presented on unadorned white textured background, standard in Volumes II-IV, a considerable improvement over several

pastel-backgrounded plates in Volume I. Ian Willis' line drawings are delightful and informative, and they serve a real purpose in illustrating behavioral aspects and anatomical features. The book's printing, color separation, and binding are of the highest quality and are in the finest tradition of Academic Press publications.

David A. Bannerman published the two-volume handbook set "The Birds of West and Equatorial Africa" in 1953. C. W. Mackworth-Praed and Captain Grant published a six volume handbook set on the birds of Africa (two volumes each for East Africa, Southern Africa, and West Africa) over a 20 year span from 1953 to 1973, but this work did not cover North Africa. These efforts, highly laudatory, are either incomplete or out-of-date. All have become collectors' pieces. "The Birds of Africa" fills an ornithological literary void in covering the entire continent.

One can only admire the intellectual energy and scholarly tenacity of the authors of The Birds of Africa considering the scattering of Africa's ornithological literature in many languages, published in a variety of local, national, and international journals, many of them obscure. When one thinks of the sheer enormity of this project, the beauty and accuracy of the result earns this volume and volumes I-III unusually high marks. The authors are to be warmly congratulated on their exceptional effort. In every way their work complements the diverse and fascinating panorama of African birds of which they so carefully write.

This volume, the first three, and the volumes yet to be published should be permanent reference fixtures in all university libraries where ornithology is taught or researched. "The Birds of Africa," destined to be an international ornithological classic, is a requirement for anyone who is seriously interested in African avifauna.—LARRY SCHWAB.

THE DOWNY WATERFOWL OF NORTH AMERICA. By Coleen H. Nelson. Illus. by the author. Delta Station Press, Delta Waterfowl Foundation, Deerfield, Illinois, and Delta Waterfowl Research Station, Delta, Manitoba, Canada. 1993:302 pp., frontispiece and nine plates in color with captions, 92 black-and-white figures with captions or annotations, numerous black-and-white sketches throughout the text, and three appendices. Cloth \$39.95 (plus \$5.00 shipping per book) in U.S., \$49.95 (plus \$5.00 shipping per book) in Canada.—This is a beautiful and valuable book representing a lifetime of work illustrating and analyzing characteristics of the newly hatched, downy young of North American waterfowl (Anseriformes). Despite its coffee-table attractiveness resulting from beautiful as well as accurate color portraits of cygnets, goslings, and ducklings in lifelike positions, it is a thorough, precise, and serious scientific work. Six pages of acknowledgements read like a "Who's Who" of waterfowl enthusiasts, and represent a major effort to determine precise facts and double-check the results. The book format involves chapters covering Introduction, Materials and Methods, and Results, followed by tribal treatments, Discussion, and a lengthy and thorough reference section. Not all headings are in the table of contents, however, and variance in size and style of type used to denote first-order headings does create some confusion.

The objectives of this major effort clearly shifted over time from a series of illustrations by a fine artist documenting characteristics of day-old young to more scientific interests clarifying patterns of importance in identification and evolution. Comments early in the text point out the influence of her observations on acceptance and use of taxonomic categories and sequence. Most tribes follow the American Ornithologists' Union Check-list of North American Birds (1983) except for the addition of the Somateriini for the eiders between the pochards (Aythyini) and sea ducks (Mergini). Choice of generic names differs more, with *Anser* used in place of *Chen* for the white Arctic geese, and *Olor* in place of *Cygnus* for the native Nearctic swans. Earlier generic names such as *Philacta canagica* (Emperor

Goose), *Mareca americana* (American Wigeon), and *Nomonyx dominica* (Masked Duck) are resurrected partly because of the plumage patterns of downy young, and supporting documentation from anatomy or genetic analysis is cited. Information and viewpoints are a positive stimulus to rethink again anseriform taxonomy.

The Materials and Methods section outlines the precise, Munsell-based color system used in the descriptions and in the special appendix that details colors documented during the author's studies. Justification for the concerted effort to use live rather than museum specimens includes representation of accurate colors and the correction of some long standing errors in the literature. Behavior and vocalizations of newly hatched young were recorded for many species, often using captive-reared birds. Geographic area of coverage is broad, including Greenland to the Aleutians, south to Hawaii and Columbia, and east to the West Indies. Thus, species like Barnacle Goose (*Branta leucopsis*), Pink-footed Goose (*Anser brachyrhynchos*), Laysan Duck *Anas laysanesis*, and White-faced Whistling Duck (*Dendrocygna viduata*) are illustrated, but marginal tropical species like the Comb Duck (*Sarkidiornis melanotus*) of Panama are not. Procedures for the weights and measurements are presented in the massive appendix table.

The Results section provides generalizations about plumage patterns, structure, vocalizations, and behavior. This is followed by sections of species- and sometimes subspecies-level treatment of the nine recognized tribes. Nine color plates are the core of this treatment, and all species are figured, including multi-color variants or phases of numerous species, many of which have not been illustrated before. The sequence of species presentation in the plates is generally taxonomic but varies due to design and spatial requirements for the plates. One plate considers subspecific variation in one species (Canada Goose, *Branta canadensis*), and other plates include as many as 11 species. Each description includes comments on general color patterns, "unfeathered parts," structural features, and, sometimes, behavior and vocalizations. A few species treatments cover subjects relating to adults, but generally the focus is solely on downy young. The Discussion considers issues of taxonomy and phylogeny, often at a worldwide level, and various biological and methodological problems that require interdisciplinary effort in the future.

Considering the 10 color plates, abundant black-and-white illustrations, and general layout and printing quality, the book is a bargain, and many will buy it for its attractiveness as well as its subject matter. The book is essential for all interested in the biology, taxonomy, evolution, and identification of waterfowl.—MILTON W. WELLER.

THE MISSISSIPPI KITE. By Eric G. Bolen and Dan Flores. Univ. of Texas Press, Austin, Texas. (The Corrie Herring Hooks Series, No. 25). 1993:128 pp., one black-and-white and 15 color photos, most with captions, one black-and-white fig., two range maps, two tables, three appendixes. \$ 17.95.—This is an enjoyable book; it transcends the usual tiresome and sterile reading of life history data. Two chapters in particular (covering 30 pages) make this book delightful. One chapter deals with the Mississippi Kite (*Ictinia mississippiensis*) in History and the other with Conservation and Management. The History chapter has four sub-sections: (1) Western Exploration and Discovery of the Mississippi Kite, (2) In the Southern Wilderness; Wilson, Long, and Audubon, (3) The Pacific Railroad Surveys and After, and (4) Mississippi Kites and Twentieth-Century Environmental Change. Section titles give an excellent idea of their content. The detective work behind the information is stimulating. For example, while the kite's scientific diagnosis and naming is credited to Alexander Wilson in 1811, it was actually discovered the first described (without being given a name and accompanying Latin description) following the 1806 expedition to the Red River.

The results and findings of that survey, however, were largely overshadowed by the seemingly more glamorous Lewis and Clark expedition, and thus the report of the Red River expedition was delayed in publishing. Only 200 copies were ever produced. The naturalist of the Red River expedition was Peter Custis, discoverer of the kite. He commented on his apparently subadult specimen (the would-be type specimen) as "A species of *Falco* which I have not seen described" and then gave a very exacting description but only in English. Too bad he did not follow the rules of nomenclature of the day and so was robbed of the privilege of naming a new species. The above events give a favor of the interesting material covered. The chapter on Conservation likewise has four sub-sections: (1) Kites in Cites, (2) Predators and People, (3) Winter Problems, and (4) Protected Areas. This chapter, in addition to discussing contemporary problems such as DDT and landscape alterations, also reviews historical aspects.

The bulk of the book (some 100 pages) covers standard life history information with chapters on Breeding and Nesting, Raising Young, and Food and Feeding. There is an extensive literature reference with 106 citations. In the introductory chapter a lengthy discussion, revolving more or less around two range maps, treats in good detail the changing nature of the species distribution and status. This chapter complements nicely Appendix C which reviews the past decade of sightings state by state. The Mississippi Kite is a species that has benefited in this century from more recent habitat alterations, having even moved into urban settings. The pre-1980s data relative to distribution and occurrence is treated in less detail and scattered throughout the book. There are delightful discussions of sexual size dimorphism, diets and helpers at the nest. Unfortunately, the treatment of size dimorphism largely limits itself to the hypothesis of food habit relationships as a driving force for size dimorphism (gender size differences are slight in raptors that feed on slow, easily caught food and dimorphism increases and is greatest in raptors that feed on agile, hard to catch food). Only lip service is given to the many other theories and especially the currently more favored and compelling sexual selection and female dominance ideas to explain the reversed sexual size dimorphism of raptors. Kin selection and the role of juvenile plumaged birds in nest helping is described and in fact helpers, which occurred at 17% of a sample of 209 nests, are mainly yearlings.

This book is well-written, easy to read, and contains new information with some provocative discussions. The price is hard to beat in today's market, and I highly recommend it even for non-raptorophiles.—CLAYTON M. WHITE.

A CENTURY OF AVIFAUNAL CHANGE IN WESTERN NORTH AMERICA. By Joseph R. Jehl, Jr. and Ned K. Johnson (eds.). Studies in Avian Biology 15, Cooper Ornithological Society. 1994:348 pp. \$40.00.—One of the events celebrating the centennial of the Cooper Ornithological Society was a symposium on the topic "A century of avifaunal change in western North America." The present book contains the papers presented at that symposium. There are 26 papers grouped in five sections including (1) regional avifaunal change, (2) population trends of major groups of birds, (3) the effects of human-induced environmental change on avian populations, (4) case histories, and (5) prospects.

This is an important book containing numerous papers making noteworthy points. For example, the decline of Neotropical migrant birds seems to have been less in western United States than in the east. Analyses of regional change provide some specific examples of local increases and expansions as well as declines. The section of population trends includes studies that indicate both positive and negative changes in bird populations—waterfowl populations may be seeing better days, raptors are showing mixed responses to habitat

alterations, and population trends of landbirds are complex, to say the least. For example, Desante and George analyze population trends of landbirds and demonstrate that over the past 13–26 years, 58 species of migratory landbirds have decreased, 44 have increased, and 35 showed no change. The book is essential reading for students of North American bird populations.—C. R. BLEM.

WHITE IBIS: WETLAND WANDERER. By Keith L. Bildstein. Smithsonian Institution Press, Washington, D.C. 1993. 272 pp., 23 b/w photos, 44 line drawings. \$22.50.—This is not, as the title might imply, a summary and discussion of all that is known about the White Ibis. Rather, it is a personalized summary of the author's research on American White Ibises in South Carolina. It offers a nice overview under a single cover of the author's diverse research on the species. His research has ranged from physiology to breeding biology and foraging ecology to the ibis' place in the community.

This is a popular book as suggested by the non-technical style. The text is easy to read. Technical terms are avoided, and the few that are used are explained in easily understood every day English. The topics and research questions such as the evolutionary significance of coloniality of birds are discussed briefly and simply without going into great detail. References are cited in the text but not so frequently as to get in the way of easy reading. At the same time, the citations are adequate to lead the reader through the quite complete reference section at the back of the book to most of the scientific literature dealing with White Ibises.

The book begins with a summary of two ibises closely connected to human history: the Sacred Ibis (*Threskiornis aethiopicus*) and Waldrapp Ibis (*Geronticus eremita*). The discovery and misidentification of the American White Ibis by early North American ornithologists focuses attention on the main topic. The book then launches into the overview of the author's research. Chapters include the study area on Pumpkinseed Island in northern coastal South Carolina, breeding biology, colonial nesting, growth and development, feeding behavior, habitat use, salt stress and prey choice, ibises in ecosystems, and the affects of Hurricane Hugo on the colony. Each chapter is thorough. Information is presented as well as evolutionary questions: e.g., why do ibises nest colonially, why are the young dark and the adults light in color, etc.

One of the most important results of this research is the finding that the salt gland of nestling ibises is largely undeveloped so that the young cannot physiologically handle the stress associated with salty prey that adults can eat with impunity. The young become dehydrated. While adults feed for themselves largely on fiddler crabs in salt marshes near the breeding colony, they travel to inland freshwater wetlands to catch crayfish which they feed to their young. This is more than a merely interesting observation. It has large implications for habitat needs and conservation. This is brought home in two chapters on conservation. Ibises nesting in estuaries along the coast require freshwater habitats to ensure a supply of unsalty food for their young. Otherwise the birds cannot breed successfully. A case in point is that of the Scarlet Ibis, considered by many to be conspecific with the White Ibis, in Trinidad. While the ibises still inhabit the island, they have not bred there since 1970. The Caroni Swamp, where the birds had previously bred, has deteriorated with influx of salt water. The loss of the freshwater habitat has coincided with the birds' cessation of breeding in the area.

The book was very pleasant reading as well as thorough and informative. I fully recommend this to professional as well as amateur ornithologists and laymen who have an interest in these birds and their habitat.—MALCOLM C. COULTER.

THE NEW ATLAS OF BREEDING BIRDS IN BRITAIN AND IRELAND; 1988–1991. Compiled by David Wingfield Gibbons, James B. Reid, and Robert A. Chapman. British Trust for Ornithology, Scottish Ornithologist's Club, and Irish Wildbird Conservancy, T & A D. Poyser, London. 1994:xiv + 520 pp., many multicolor maps and black-and-white sketches. £40.—Readers of these review pages are acutely aware that there has been a flood of state, and even county, breeding bird atlases in recent years. More are on the way as “atlasing” has become a popular “sport” for both birders and ornithologists. The atlas concept was introduced to the birding community by the British and Irish ornithologists, who in 1976 published the first “Atlas of Breeding Birds in Britain and Ireland” from field work in the period 1968–1972. The idea spread throughout the world, and the many atlasers and the compilers, who have worked long and hard, can be justifiably proud of their results which have equaled or even surpassed the British effort.

But now comes “The Breeding Bird Atlas: The Next Generation!” “The New Atlas of Breeding Birds in Britain and Ireland: 1988–1991” sets a new mark for the rest of the world to shoot at. It is an outstanding job, both in the field work that went in to it, and the handsome format of publication.

One criticism of the conventional atlas is that the reader gets the idea that a species which occurs throughout the given area is equally abundant throughout. The organizers of this project have made an attempt to solve this problem and have arrived at a method of expressing abundance. Each 10 × 10 km Atlas block was divided into 25 “tetrads” (2 × 2 km small blocks). Observers were instructed to visit at least eight tetrads in a block, and compile a species list after exactly two hours spent in the tetrad. From the fraction of tetrads having the species, an index of abundance was computed. These indices are displayed on a map printed in 10 colors. For seabirds and other colonial species, actual counts were made.

The conventional atlas map recognizes two levels of presence: seen or possible, but no direct breeding evidence, and probable or confirmed breeding evidence. Because of the emphasis on the quantitative work, less effort was expended on confirming breeding than in the earlier atlas.

A third map in most accounts plots the change in presence from the earlier work. Thus a careful study of this map shows range expansions or contractions since 1972.

Each breeding species is given a two-page spread. Besides the three maps, there is an attractive sketch of the species, often in interesting activity, and about one page of text.

The Atlas concludes with a careful analysis of the changing status of the breeding birds over the period of the two atlases and the intervening years. The number of breeding species increased by three in Britain and by two in Ireland from the earlier results, but the changes were more pronounced than the numbers might indicate. In Britain, four species that bred in 1968–1972 did not breed in 1988–1991, while five species bred in the second period that did not breed in the first. In addition eight species bred in the years 1973–1987 but were not present during the time of both Atlas projects. A total of 89 species had positive distributional changes, while 113 showed negative changes. These are analysed by habitat.

In an attempt to check the tetrad method of determining abundance for bias and error, two additional abundance projects were carried out. After a discussion of general methods of estimating populations, a table of estimated populations of all species is given. These numbers range from several million for such species as House Sparrow (*Passer domesticus*), Blue Tit (*Parus caeruleus*), and Willow Warbler (*Phylloscopus trochilus*) to such low numbers as 1–2 pairs for Brambling (*Fringilla montifringilla*) and 0–1 pair for Red-backed Shrike (*Lanius collurio*).

The New Atlas sets a high standard; it remains to be seen if American atlases of the future can match it.—GEORGE A. HALL.

CURRENT ORNITHOLOGY. Vol. 11. Dennis M. Power (ed.). Plenum Press, New York, New York. 1993:292pp—This book, the most recent volume in the series, includes chapters on population trends in the eastern United States, social organization of birds in the nonbreeding season, predation of birds, and effects of life history parameters on length of incubation and hatching asynchrony in altricial birds. The quality of these chapters, as usual, is quite high. The editing is good, resulting in readable prose relatively free of error. The chapters are consistent in format and appearance.

The first chapter, by Robert A. Askins, reviews the decline of North American birds and supports the contention that many species of terrestrial birds have declined over the past 25 years. However, Askins shows that, while populations of many species of forest migrants have decreased at particular sites, most species of forest migrants have shown an overall increase during the past 25 years. Long-term trends are difficult to determine because of wide fluctuations from year to year. Furthermore, grassland and shrubland birds have likewise diminished over the period. Fragmentation of forest and loss of winter habitat in Mexico, Central America, and the Greater Antilles are serious influences on bird abundance.

In the second chapter, William M. Block and Leonard A. Brennan review the habitat concept in ornithology and provide a stimulating discussion of the ways in which habitat can be used as a unifying concept.

Erik Matthysen discusses nonbreeding social organization in migratory and resident birds in chapter 3. He reviews populations that maintain associations outside the breeding season and analyzes the benefits of such behavior.

Chapter 4 by I. Newton deals with predation and limitation of bird population densities. He provides a comprehensive review of the possible types of predator-prey interactions that can depress bird breeding numbers below what would otherwise occur. He provides a very insightful look at the effects of predators both by themselves and in the more complex reality of natural ecosystems.

The final chapter by Robert E. Ricklefs is a very extensive review of sibling competition, hatching asynchrony, incubation period, and life span in altricial birds. I found this chapter particularly persuasive and stimulatory. It is meticulous in its logic and focus. Students of clutch size, brood development, and the nesting cycle should read his discussion of theories of hatching synchrony and the evolution of incubation period as possibly affected by just about every conceivable variable.

As in past volumes, this book provides a tremendous service to both new students and more experienced researchers. The discussions provided allow the beginner to quickly come up to speed in specific areas and undoubtedly promote the quality of thesis/dissertation research as a result. For more experienced readers they provide new viewpoints, corrections of misconceptions, and a means of checking what we think we already know. Thank you, Plenum Press, for continuing to publish these valuable reviews.—C. R. Blem.