classical ethology by ornithologists and others, or will be seen as an example of a once valuable but now largely dated approach that must give way to the more recent fashions of behavioral ecology, sociobiology, and neuroethology, must await the verdict of history.—ROGER M. EVANS.

The secular ark. Studies in the history of biogeography.—Janet Browne. 1983. New Haven, Connecticut, Yale University Press. x + 273 pp. ISBN 0-300-02460-6.—Biogeography lies at the intersection of many biological disciplines. Systematics, in particular, has been most concerned with biogeographic theory and methodology, but one could also claim that thinking about biotic distribution also has invigorated, and expanded, the content of ecology. Likewise, we have long known that the core question of evolutionary biology—the origin of species—cannot be solved without a deep understanding of the spatial history of populations and taxa. Thus, space, along with time and form (in its broadest interpretation), are the conceptual cornerstones of historical biology, in any of its various guises.

Janet Browne's book is a history of biogeography covering the period up to the last quarter of the 19th century. Although it makes scant mention of contemporary controversies, biologists with an interest in biogeography will profit from reading this book simply because it reveals the ways in which many current ideas about biotic distribution have developed.

Biogeographic analysis began within the context of a creationist worldview. A literal interpretation of the Bible held sway among many scientists and natural historians until the end of the 19th century, and the influences of that interpretation have extended to the present day (and not just in the writings of recent creationists). Thus, the notion of a center of origin and dispersal from that center to produce cosmopolitanism arose from the widely accepted religious belief that all species dispersed from Mount Ararat following the so-called Flood. As Browne notes (p. 10): “Literal-minded natural philosophers therefore were obliged to explain how animals had arrived at their final destination. And this, in a sense, marks the first beginnings of the study of geographic dispersal.”

Through the 18th and 19th centuries, more and more organisms were discovered and described. That not all could fit into the Ark forced a reevaluation of distributional data, and before long the concept of multiple “centers of creation” supplanted the single center of Mount Ararat. The proposition of dispersal from a localized center did not change, but these new data led to another concept, namely that a flora or fauna could be considered as endemic to a restricted area: taxa were not found to be distributed willy-nilly across the globe. Areas of endemism, or biotic provinces, therefore, forced these workers to ask where species came from and why they were distributed in the ways they were.

Two biologists, in particular, helped create the science of biogeography. In Germany, Alexander von Humboldt (1769–1859) compared the composition of floras with the geographical distribution of physical parameters such as atmospheric pressure (he coined the term isobar) and minimum and maximum temperatures. He concluded that physical conditions were the prime determinants of distribution. Likewise, the Swiss botanist Augustin de Candolle (1778–1841) stressed this same relationship but added a biological dimension: there is a “struggle for existence” with individual plants competing for space and light. Darwin's view of the evolutionary process was no accident: he learned his botanical geography from Candolle's Essai Élémentaire de géographie botanique (1820).

Throughout the first half of the 19th century, biogeography became a science of patterns: provinces were demarcated and compared, diversity gradients were described. The causal history of these patterns began to emerge from the study of fossil assemblages and earth history; if organisms and geology changed, then so too must have distributional patterns. The earth became, to use Browne's metaphor, a chessboard. Perhaps the most important problem to arise during this period was that of disjunct species or varieties. How could these be explained? Given the Biblical literalism still evident in the times, disjuncts clearly suggested multiple centers of creation. But for those seeking a naturalistic explanation, disjunct species directed attention to the possibility of an evolutionary origin in a way that few other observations could.

Focusing on the disjunct distributions of alpine-boreal floras across much of Europe, the eminent geologist Edward Forbes (1815–1854) proposed that a continent-wide subsidence during the Pleistocene, accompanied by extremely cold conditions, permitted the northern flora to become widely distributed via dispersal. At the end of the Pleistocene, he postulated, uplift and a return to less severe climatic conditions fragmented these floras and isolated them on high mountains. Forbes's hypothesis was important because multiple centers of creation were no longer necessary: widely accepted geological processes could account for the disjunct biotas via vicariance, or fragmentation. Seen from a modern perspective, these same kinds of explanations also do away with the need to invoke long-distance dispersal across a static (or quasi-static) landscape to explain disjunct patterns.

Darwin had developed, but not yet published, many of the same ideas as Forbes. Yet, Darwin, like many of his contemporaries, seemed to emphasize dispersalist explanations. Combined with his notion of competition and “survival of the fittest” as mechanisms of change, dispersal explained the presumed move-
Iowa birds.—James J. Dinsmore, Thomas H. Kent, Darwin Koenig, Peter C. Petersen, and Dean M. Roosa. 1984. Ames, Iowa, The Iowa State University Press. 356 pp., 49 black-and-white photographs, 132 distributional maps. ISBN 0-8138-0206-7. Cloth, $27.95.—Five of Iowa’s ornithologists and/or birders have teamed up to produce that state’s latest annotated checklist. It could be considered the “fourth edition,” preceded by Anderson (1907), DuMont (1933), and Brown (1971). These authors regard the Iowa State List to be 362 species of which 276 are regular, 16 casual, 62 accidental, 6 extripated, and 2 extinct. They also discuss 12 hypothetical and 26 other unacceptable species. The treatment of each species is fairly consistent, even though species groups were divided among the various authors. For each species the following is covered (if applicable): status, habitat, spring and fall migration, summer, winter, comment, and reference. The simplified distributional maps show many records at a glance. The arrangement of the species follows the Thirty-fourth Supplement to the American Ornithologists’ Union Check-list of North American Birds (1982).

The status, although precise, is somewhat confusing, because it is defined 4 ways: 1) categories of occurrence (divided into 5 terms), 2) frequency (divided into 4 terms), 3) seasonal occurrence (divided into 4 terms), and 4) firmness of data (divided into 8 terms). Most of these are self-explanatory, although the authors admit the frequency terms are difficult to apply. Each frequency term represents numbers, e.g. common = 6-49 (birds) per day or 25-249 (birds) per season. These numbers do not seem to be correlated in the text and apparently were not based on data in most cases. It seems that such vague terms should not represent precise numbers. Under categories of occurrence the term accidental is applied somewhat differently than usual, and another term, e.g. occasional, would have fit better. The firmness of data—evidence of occurrence by specimens, photographs, or sight records—is discussed at length but is cryptic in the species accounts. One has to keep flipping back to see that Class III is a species documented by a sight record or that Class V is a possibly accurate record. It would have been better to spell it out in the species accounts. All records were screened by the Iowa Ornithological Records Committee, of which 4 of the 5 authors are members.

Habitat given is usually general, although in some cases it is quite specific. It is stated, and rightly so, for only regular and casual occurring species.

Generalized times of occurrence are given with three specific migration dates for early and late dates for spring and fall. Like most checklists, more information is presented for uncommon and rare than common species. Summer and winter seasonal data are mostly from Breeding Bird Surveys and Christmas Bird Counts.

Comments vary widely—there was a special effort to expand vagrant synopsis to include records from surrounding states so that a more rounded picture emerges. This should be especially interesting to birders. Also discussed under comments are nomenclature, aids to identification, large counts, reasons for increases or declines, and areas for further study. Pertinent references are listed after each species and also at the back of the book. In the appendices is also a list of all the species by categories of occurrence, a list of the year when the species was first detected, a gazetteer, and the index.

At the beginning of the checklist are sections on Iowa’s climate, geography, and natural regions and how they are related to bird distribution. Other sections include “Breeding and Endangered Species,” which were combined because only species that breed