Weaving the various aspects of blood as it is recognized in contemporary and historical art, politics, and science into a coherent whole presents a major challenge. The curators' efforts seem only partially successful because the thread is sometimes lost. Visitors to the exhibition will probably find the guided tours and lectures helpful. They, and anyone interested in the topic, will also enjoy the more comprehensive overview provided by the excellent and convincing essays in the exhibition's catalog.

BOOKS: EVOLUTION

A Grand Old Synthesizer's Overview

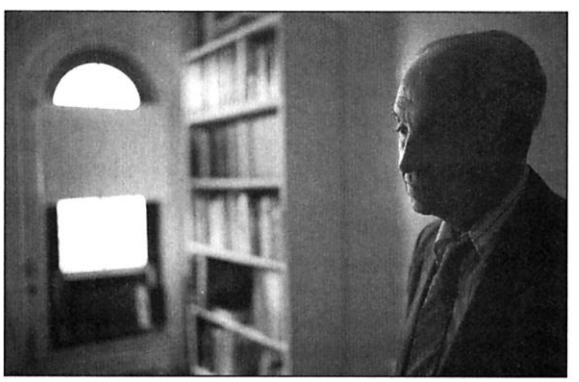
Menno Schilthuizen

The research institute where I work is located in an area of high tropical biodiversity: Borneo. Twice a year, it organizes a large expedition to mountainous and forested areas in the interior. We travel in air-conditioned off-road vehicles and motorized river boats. Navigation is by Global Positioning System, communication by satellite phone, and in case of an emergency, help can arrive by helicopter. Three-quarters of a century ago—long before the word biodiversity was even invented—the young German ornithologist Ernst Mayr did not have any of these modern conveniences during the four continuous years he spent on expeditions in and around New Guinea, another island with a remarkably diverse biota. As Jared Diamond notes in his foreword to *What Evolution Is*, Mayr was officially reported killed by local tribes; survived malaria, dengue fever, and dysentery; nearly drowned in an overturned canoe; and endured a forced descent of a waterfall. Despite such travails, Mayr returned safely with thousands of bird specimens, which laid the basis for one of the most influential careers in evolutionary biology.

What Evolution Is
by Ernst Mayr
Basic Books, New York, 2001. 336 pp. $26, C$39.50. ISBN 0-465-04425-5.

Mayr played a major role in the forging of the "modern synthesis": an amalgamation of genetics, systematics, paleontology, and ecology that united Darwin's theory of natural selection with the developing understanding of the mechanisms of heredity. His main contribution to the synthesis, *Systematics and the Origin of Species* (Columbia Univ. Press, New York, 1942), was followed by another classic, *Animal Species and Evolution* (Harvard Univ. Press, Cambridge, MA, 1963). Other milestones in his career include a dozen or so books on ornithology, systematics, and the history and philosophy of biology. He has witnessed, usually up close, all the major developments in evolutionary biology over most of the 20th century (population genetic theory, cladistics, molecular phylogenetics, and evo-devo, to name but a few). At age 97, he still keeps an office at Harvard, and he continues to write. *What Evolution Is*, his latest book, aims to be "a primer on evolution for the general reader." Given Mayr's status as the grand old man in the field, such a goal raises high expectations.

In some respects, the book lives up to these expectations; in others, it disappoints. To offer an overview of such a large and diverse subject within the space of less than 300 pages of text, Mayr draws mainly on his earlier writings. These are condensed; stripped of most references, examples, and illustrations; and usually updated with modern insights. Unfortunately, the result often makes for rather boring reading. Fascinating subjects such as isolating mechanisms (the structures and behaviors that prevent different species from hybridizing), which were so brilliantly treated in *Animal Species and Evolution*, are here dealt with in abstract terms in a page or less. Although Mayr succeeds at being complete but succinct, his approach leaves little space for illustrative examples. For the general reader, Mayr's account may have leapt to life more frequently if he had sacrificed completeness for attractiveness.



Ernst Mayr.

Another element that may pose an obstacle to the intended audience is the occasionally polemic style. Evolutionary biology is a discipline rife with controversy, and over his many years of writing, Mayr has adopted the habit of weaving into his accounts defenses (and sometimes offenses) aimed at his critics. In academic literature, this style is often an effective means of proving a point. However, for the naïve layperson, unfamiliar with the various evolutionary "camps," the small kicks and punches (aimed at, for example, Paterson's recognition species concept and Kimura's view of neutral evolution) that dot the text may be only puzzling.

To his credit, Mayr has attempted to bring most of the sections in the book up to date with new data. For example, the recently amassed paleontological data on the evolution of whales and their relatives are brought in to illustrate the fossil evidence for evolution. He even generously acknowledges the existence of sympatric speciation (the splitting of species without prior geographical isolation), a concept he once vehemently opposed. In discussing this process, he cites celebrated examples from the cichlid fish of crater lakes in Cameroon and host-specific herbivorous insects, studies that gained prominence in the 1990s.

Still, such modernizations are only implemented where they fit within one of Mayr's familiar themes. Disciplines that emerged after the 1970s are largely ignored. About transposons and other selfish genetic elements—the study of which is now a burgeoning field full of implications for speciation, sexual selection, and phylogenetics—Mayr says it is "not clear whether the phenomenon is widespread." Sexual selection by female choice, another relatively recent field, which has enjoyed substantial empirical and theoretical advances, gets only six lines.

Among the more interesting parts of the book are the two appendices. Mayr offers these, in part, to lend a helping hand to evolutionists who find themselves facing creationism or just plain ignorance as well as to creationists who may "simply want to know more about the current paradigm of evolutionary science if for no other reason than to be better able to argue against it." Here, Mayr gives answers that will be as infuriating to creationists as the questions—"Is evolution a fact?" "How can we prove evolution if we cannot do experiments?"—themselves are to evolutionists.

In summary, *What Evolution Is* is an interesting and important book because Ernst Mayr is an interesting and important scientist. The work also offers historians of biology a view of how Mayr, who shaped evolutionary biology during the 20th century, views the state of the field at the start of the 21st. However, the book's cursory style and neglect of major new developments make me doubt that it will be, as the author intended, the evolution text for the educated public.

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