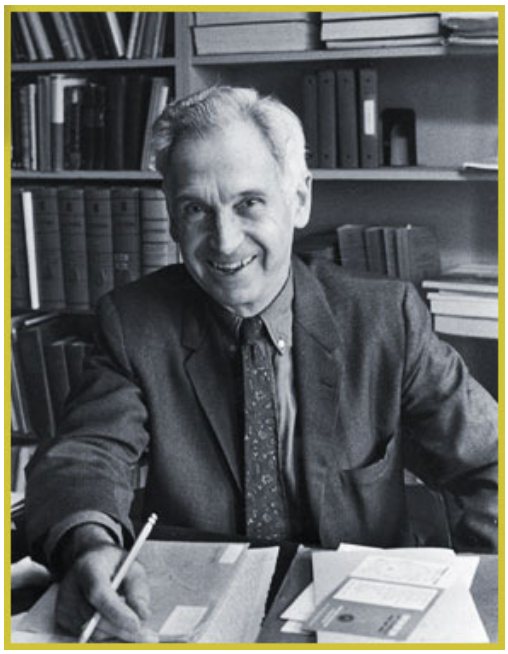
Ernst Mayr (1904-2005)



"The theory of evolution is quite rightly called the greatest unifying theory in biology. The diversity of organisms, similarities and differences between kinds of organisms, patterns of distribution and behavior, adaptation and interaction, all this was merely a bewildering chaos of facts until given meaning by the evolutionary theory."

in *Populations, Species, and Evolution by* Mayr (1970), Cambridge: Harvard University Press

Ernst Mayr, one of the world's leading evolutionary biologists, died on February 03, 2005. He is one of the scientists who led to the modern synthesis of Mendelian genetics and Darwinian evolution and one of the architects who shaped the landscape of modern biology. His works were not limited to research: he was one of the most prolific writers to educate the general public in layman's words. He is also credited for pioneering studies of history and philosophy of biology.

Mayr was born in Kempten, Germany on July 5, 1904. His fascination with wildlife that started when he was very young and his sighting of Red-crested Pochard (*Netta rufina*) in Germany, a species that had not been sighted in Europe for 77 years, made him stop pursuing a career in the medical profession. Story has it that he completed his PhD research in 16 months after being offered the chance to visit the tropics on an ornithological expedition. After 1923 Mayr began working in the bird collection of the Berlin Museum. Having graduated from the University of Berlin, he went on a few ornithological expeditions to the Pacific, leading three scientific expeditions to New Guinea and the Solomon Islands from 1928-1930. While on expedition, he studied many birds in the regions and upon his return became famous for his neo-darwinian views on evolution.

Mayr moved to the USA in 1931 where he worked as Curator of the Whitney-Rothschild Collection at the American Museum of Natural History from 1932 to 1953. From 1953 to 1975 he was Professor of Zoology at Harvard University. After retirement he never stopped working. He published several books and more than 200 articles since retiring, attending conferences and giving seminars. His last book "What Makes Biology Unique?" was published at age 100 and for his 100th birthday he published in *Science* the article "80 years of watching the evolutionary scenery". In his last book he wrote that "this will be my last survey of controversial concepts in biology. I have previously published papers on nearly all these subjects, in some cases more than one. Indeed, an analysis of my bibliography reveals that I have discussed the species problem in no fewer than sixty-four of my publications, and have been involved in numerous controversies. What I now offer is a revised, more mature, version of my thoughts. I am not so optimistic to believe that I have settled all (or even most) of these controversies, but I do hope to have brought some clarity into some rather confused issues" (Mayr 2004). However resigned he may sound to some people, indeed his writing was versatile and he was at the center of some most furious scientific debates. As a leading evolutionary biologist and writer in the field, he was also a public enemy for creationists.

Mayr has received all three of the awards that make up the triple crown in biology. He won the Balzan Prize in 1983, the International Prize for Biology for his work in systematics. He won the Crafoord Prize by the Royal Swedish Academy of Sciences, jointly with John Maynard Smith of the University of Sussex and George C. Williams of State University of New York. They were awarded this prestigious award for their roles and

contributions in broadening and refining the understanding of evolution and its phenomenon. In addition, he also received the National Medal of Science.

Ernst Mayr is known for his role in making sure that biology stood side-by-side with other fundamental sciences such as physics and chemistry. He has also been called "the Darwin of the 20th century." It is true that the only bridge, in many ways, between Darwin's *Origin* and modern students has become his dissection of Darwin's theory into five subtheories as most modern biology students do not read the *Origin*.

His main achievements were:

- As a leading expert on the birds of New Guinea and the tropical southwest pacific. He described more species and subspecies of living birds than anyone else.
- He succeeded in showing how the adaptive changes that natural selection produces in single populations result in the evolution of biodiversity. This became known as the 'evolutionary synthesis' on which he worked with George Gaylord Simpson, and Theodosius Dobzhansky. It was this synthesis that brought together the fields of geneticists and field naturalists.
- Mayr proposed a speciation mechanism called allopatry. Allopatry begins when subpopulations of a species become isolated geographically (for example, by habitat fragmentation or migration). The isolated populations are then liable to diverge evolutionarily over many generations as a) they become subjected to dissimilar selective pressures and b) they independently undergo genetic drift; particularly when one of the subpopulations is small (a scenario that leads to the "founder effect").
- Models derived from his biogeography work have provided a means by which many researchers have been able to test their results and hypotheses.
- He studied in detail the interaction between population genetics and evolutionary processes. His work involved criticism of reductionist genetic approaches to evolution ("bean bag genetics") arguing that evolutionary pressures act on the whole organism, not on single genes, and that genes can have different effects depending on the other genes present. He advocated a study of the whole genome rather than of isolated genes.
- He was a prolific writer examining in detail many of the concepts central to biology.

Key publications (books and high-impact articles)

Some of the books by Ernst Mayr:

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