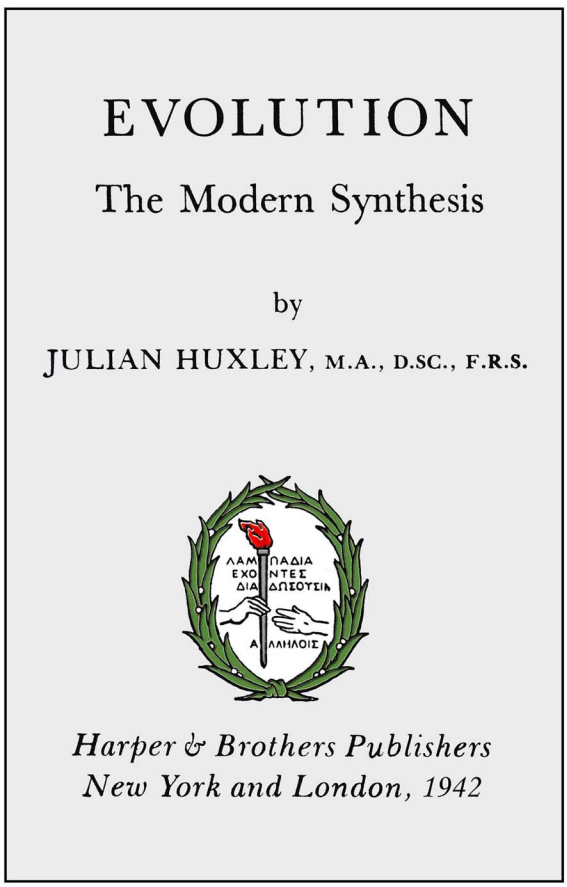
From Darwinism to Evolutionary Biology

IN THE NEWS FOCUS STORY "MODERNIZING the modern synthesis" (11 July, p. 196), E. Pennisi reports that, seven decades after the publication of Julian Huxley's seminal book (*1*), we need another update of our concepts about the mechanisms of evolution (*2*). Such a major revision and expansion of Darwin's classical theory of descent with modification has already been attempted by several evolutionary biologists.

Twenty years ago, Endler and McLellan (*3*) suggested an approach toward a newer synthesis. However, Carroll (*4*) was the first to explicitly point out that data from molecular and developmental biology, geology, and the fossil record should be integrated into an "expanded evolutionary synthesis." In more recent publications, an expansion of the synthetic theory by integration of 10 additional disciplines from the biological, geological, and computer sciences was proposed (*5*, *6*). In addition, these authors incorporated the neglected concept of symbiogenesis (i.e., the subtheories of primary and secondary endosymbiosis) into this version of the expanded synthetic theory. These key macroevolutionary processes in the history of aquatic unicellular life on Earth led to the emergence of the first eukaryotic cells, which later gave rise to animals and plants. Moreover, ancient secondary endosymbiotic events led to the majority of extant photosynthetic phytoplankton taxa of the oceans (such as dinoflagellates).

On the last page of his monograph, Huxley (*1*) introduced the term "evolutionary biology." This interdisciplinary branch of the life sciences has evolved into a system of theories that explain different aspects of organismic evolution (*5*). I recommend that we replace old-fashioned terms such as "Darwinism" and "synthetic theory" by Huxley's "evolutionary biology."


EVOLUTION

The Modern Synthesis

by

JULIAN HUXLEY, M.A., D.SC., F.R.S.

Harper & Brothers Publishers
New York and London, 1942

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5. U. Kutschera, K. J. Niklas, *Naturwissenschaften* **91**, 255 (2004).
6. F. P. Ryan, *Biol. J. Linn. Soc.* **88**, 655 (2006).