

Evolutionary Progress?

BY TIMOTHY SHANAHAN

Progress might have been all right once, but it has gone on too long. (Ogden Nash 1962, p. 11)

That the history of life on Earth manifests some sort of progress has seemed obvious to many biologists. Once there were only the simplest sorts of living things—replicating molecules, perhaps. Now the world contains innumerable species displaying amazing adaptations fitting them for every conceivable niche in the economy of nature. How could anyone who accepts an evolutionary view of life deny that progress has occurred? Yet perhaps no other issue in evolutionary biology has inspired such passionate controversy. According to one prominent critic, Stephen Jay Gould, “Progress is a noxious, culturally embedded, untestable, nonoperational, intractable idea that must be replaced if we wish to understand the patterns of history” (Gould 1988, p. 319). Other critics, such as William Provine, are somewhat less contemptuous but equally dismissive of the idea of evolutionary progress, issuing the common complaint that “the problem is that there is no ultimate basis in the evolutionary process from which to judge true progress” (Provine 1988, p. 63).

Undaunted by these attacks, however, contemporary friends of the concept of evolutionary progress have insisted on its centrality in a Darwinian view of life. According to Richard Dawkins, the most important features of evolution simply cannot be understood correctly without embracing the notion of evolutionary progress: “[A]daptive evolution is not just incidentally progressive, it is deeply, dyed-in-the-wool, indispensably progressive. It is fundamentally necessary that it should be progressive if Darwinian natural selection is to perform the explanatory role in our world view that we require of it, and that it alone can perform” (Dawkins 1997, p. 1017). In Ernst Mayr’s view, progress in evolution is simply as obvious, and as undeniable, as the manifest progress in the development of the automobile (Mayr 1994).

As these divergent viewpoints reveal, the notion of evo-

lutionary progress remains a hotly contested idea in evolutionary biology (Gould 1996, 1997; Ruse 1996). A cursory examination of this issue might tempt one to conclude that it is inherently unresolvable (Ruse 1993). But as I will try to show, the question, “Is evolution progressive?” admits of the same sort of answer as other questions in evolutionary biology. The key lies in spelling out more carefully the meaning of the term evolutionary progress. But although being clear about the meaning(s) of this term is necessary, it is not sufficient for answering this question. Once the meaning(s) of the term evolutionary progress has been clarified, there remains the empirical and interpretive task of determining whether evolution is progressive in one or more of these senses.

There are, then, two basic questions concerning evolutionary progress: First, what is meant by evolutionary progress? Second, is evolution, in fact, progressive? With regard to the first question, I will argue that the notion of evolutionary progress has both a core meaning as well as a set of clearly specifiable alternative interpretations, each of which needs to be carefully identified. In response to the second question, I will argue that if some conceptions of evolutionary progress are exemplified in the history of life, then evolution must be considered progressive, at least insofar as those conceptions are concerned. Indeed, given the range of legitimate interpretations of evolutionary progress, it will almost necessarily be the case that evolution is progressive according to one of these interpretations.

What is evolutionary progress?

The notion of evolutionary progress has accumulated a range of connotations. Consequently, it is worthwhile to return to the core concept of evolutionary progress (i.e., those features of evolutionary progress that virtually everyone, despite their other differences, would agree to) to see what the basic concept requires. This can be done by imagining a hypothetical world in which there is no evolutionary progress and then adding elements to this picture one by one until progress emerges. The result will be the minimum set of ingredients necessary for evolutionary progress.

Evolutionary progress requires change in a population. Imagine a world of entities in which there is no change whatsoever. An observer visiting that world today would observe exactly the same things as she would have seen on a visit a hundred, a thousand, or a million years ago. Clearly, such a world would not be described as

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Atlas of Protein Sequence and Structure ,1972 **Building Blocks in Life Science** Gary Parker,2010-11 Provides exceptional insights and clarity to patterns of order in living things including the promise of healing and new birth in Christ

Applying Evolutionary Archaeology Michael J. O'Brien,R. Lee Lyman,2007-05-08 Anthropology and by extension archaeology has had a long standing interest in evolution in one or several of its various guises Pick up any lengthy treatise on humankind written in the last quarter of the nineteenth century and the chances are good that the word evolution will appear somewhere in the text If for some reason the word itself is absent the odds are excellent that at least the concept of change over time will have a central role in the discussion After one of the preeminent and often vilified social scientists of the nineteenth century Herbert Spencer popularized the term in the 1850s evolution became more or less a household word usually being used synonymously with change albeit change over extended periods of time Later through the writings of Edward Burnett Tylor Lewis Henry Morgan and others the notion of evolution as it applies to stages of social and political development assumed a prominent position in anthropological discussions To those with only a passing knowledge of American anthropology it often appears that evolutionism in the early twentieth century went into a decline at the hands of Franz Boas and those of similar outlook often termed particularists However it was not evolutionism that was under attack but rather comparativism an approach that used the ethnographic present as a key to understanding how and why past peoples lived the way they did Boas 1896 The London Quarterly Review William Lonsdale Watkinson,William Theophilus Davison,1925

Distribution and Evolution of Hemoglobin and Globin Loci James E. Bowman,1983 Sitting in the Lotus Blossom Diane Goble,2010-08-31 In 1989 I had started to write a book about the art of conscious dying but every time I sat down to write information that had nothing to do with that concept kept coming through I decided to meditate to try to figure out what was going on I started seeing strange faces arising out of the darkness and messages like a moving LED sign displaying a continuous series of symbols that made no sense to me Then I would stop meditating and start writing information that didn't seem to be coming from my mind It seemed as though I was stepping down this other information from these unknown beings and translating it into written words They wouldn't leave me alone to write my book until finally I agreed to write their book first then they would help me with the book I wanted to write Sitting in the Lotus Blossom is the information they asked me to translate into written language and share with the world It is about the meaning of life this life and the life beyond the evolution of consciousness and who we truly are I asked them who they were and what they looked like and using my cartoon drawing talent I drew them as I saw them I know it's a little weird and this was during the New Age revolution but every time I go back and read what I transcribed I'm amazed at the insight they imparted London Quarterly Review ,1925 *Hemoglobin and Its Abnormalities* Vernon M. Ingram,1961 **A Natural History of the British Lepidoptera** James William Tutt,1900 Study Guide for Biochemistry, 2nd Ed., [by] Christopher K. Mathews, K.E. Van Holde

Christopher K. Mathews, Harry Ako, 1996 *In the Light of Evolution* National Academy of Sciences, 2009-11-30 Two Centuries of Darwin is the outgrowth of an Arthur M Sackler Colloquium sponsored by the National Academy of Sciences on January 16 17 2009 In the chapters of this book leading evolutionary biologists and science historians reflect on and commemorate the Darwinian Revolution They canvass modern research approaches and current scientific thought on each of the three main categories of selection natural artificial and sexual that Darwin addressed during his career Although Darwin's legacy is associated primarily with the illumination of natural selection in *The Origin* he also contemplated and wrote extensively about what we now term artificial selection and sexual selection In a concluding section of this book several science historians comment on Darwin's seminal contributions Two Centuries of Darwin is the third book of the *In the Light of Evolution* series Each installment in the series explores evolutionary perspectives on a particular biological topic that is scientifically intriguing but also has special relevance to contemporary societal issues or challenges The ILE series aims to interpret phenomena in various areas of biology through the lens of evolution and address some of the most intellectually engaging as well as pragmatically important societal issues of our times

Behavioral Effects of Microwave Radiation Absorption, 1985 **A Natural History of the British Butterflies** James William Tutt, 1900 **Paleobiology**, 1991 **A Critique of the theory of evolution** Thomas Hunt Morgan, 1916 **The Crusader**, 1922 **International Books in Print**, 1997 **Galaxy Evolution** Vladimir Avila-Reese, 2003 **Evolution, Development and Ecology of Anemonefishes** Vincent Laudet, Timothy Ravasi, 2022-11-07 Anemonefishes one of the most popular and recognizable of fishes in the world are much more than film characters they are also emerging model organisms for studying the biology ecology and evolution of coral reef fishes They are a group of 28 species often employed to study patterns and processes of social organization intra and inter specific competition sex change mutualism dispersal and connectivity of fish populations habitat selection pigment pattern formation lifespan and predator prey interactions This multi authored book covers all these areas and provides an update on the research done with this model and the perspective it opens for the future Key Features Contains basic and up to date information on an emerging fish model Allows non specialist readers to grasp the relevance of a wide research area Provides accurate and easy to access information on each of the 28 species Includes guidance for establishing a breeding colony Documents that anemonefishes are useful model organisms for ecological developmental and climate research The Open Access version of this book available at www.taylorfrancis.com has been made available under a Creative Commons Attribution Non Commercial No Derivatives 4.0 license

Evolution Monroe W. Strickberger, 1996 Strickberger's *Evolution* Second Edition provides a sweeping introduction that covers the chronology and mechanisms of evolution Various chapters are devoted to topics that include the historical development of evolutionary thought cosmological and geological events evolution of genetic systems and molecular pathways and accounts of organisms from plants to humans In studying the history of life students will begin to recognize the interrelatedness of many scientific fields

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