The Age of Man: A Father Figure

IN HIS NEWS & ANALYSIS STORY “ARCHAEOLOGISTS SAY THE ‘Anthropocene’ is here—but it began long ago” (19 April, p. 261), M. Balter reports that the “Age of Man,” characterized by detrimental environmental changes caused by human activities, may have begun thousands of years ago. This hypothesis was proposed more than a century ago by Alfred Russel Wallace (1823–1913), one of the greatest evolutionary biologists of the 19th century (1). Wallace is well known as the codiscoverer of the Darwinian principle of natural selection and as the founder of biogeography (2).

As Wallace was interested in many subjects, including anthropology, psychology, politics, and economics (1), he was well qualified to evaluate the impact of humans on natural habitats from an evolutionary perspective. In 1898, he described “[t]he plunder of the earth,” with reference to the “struggle for wealth” by irresponsible humans (3). Wallace lamented the “reckless destruction of stored-up products of nature … not equaled in amount during the whole preceding period of human history” and the “clearing of (the tropical) forests … to make coffee plantations.” He concluded that “[t]he devastation caused by the great deserts of the Middle Ages and of antiquity … has thus been reproduced in our times” (3).

In 1910, Wallace described the era of human environmental destructiveness, which started with the systematic use of fire and the possession of weapons for hunting (4). He also argued that “the extinction of so many large Mammalia (at the end of the Pleistocene) is actually due to man’s agency” (4). Hence, Wallace is the spiritual father of the “overkill hypothesis”—i.e., the idea that extensive hunting by early humans may have caused megafaunal extinctions, which led to zoologically devastated ecosystems (4).

The year 2013 marks the centenary of Wallace’s death. It should be acknowledged that this “unselﬁ sh man in the shadow of Darwin” (1, 2) was the ﬁ rst scientist who outlined, in his popular books (3, 4), what we today (unofﬁ cially) call the Anthropocene.

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References

The Age of Man: Outpacing Evolution

IN THE NEWS & ANALYSIS STORY “Archaeologists say the ‘Anthropocene’ is here—but it began long ago” (M. Balter, 19 April, p. 261), Bruce Smith explains that the term “Anthropocene” was originally proposed as “a strategy for getting the public to appreciate the extent to which humans were destroying the world.” In this case, one might deﬁ ne the beginning of the Anthropocene as the point in time at which humans began altering the environment more quickly than biodiversity and ecosystems evolve and adapt to those changes. According to this deﬁ nition, the era began long after the beginning of agriculture and even later than the beginning of the Industrial Revolution in 1750 CE. We propose that the Anthropocene began in the United States in the 1930s and spread globally during the green revolution from the 1950s to the 1970s.

During this time period, the human appropriation of net primary production increased markedly (1), and the quantity of materials mobilized, either directly or indirectly, by humans (anthropogenic ﬂ ows) began to exceed the corresponding ﬂ ows of resources unaffected by humans (geogenic ﬂ ows). Recent abrupt changes, such as the green revolution and China’s rapid industrialization, differ substantially from the pace of previous changes, such as agricultural practices, which evolved over centuries and thus allowed species and species interac-
tions to coevolve. The systems resulting from those gradual changes maintained an equilibrium that beneﬁ ts conservation, sustainable production, and cultural ecosystem services. To protect future human civilizations from the effects of the Anthropocene, we should work to decelerate change to gain time for evolution (2) and prevent breakdowns in ecosystem services (3).

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