

EXTINCTION

An end to human exceptionalism

Our species' extinction is inevitable, argues a paleontologist

By **Adrian Woolfson**

In the *Aeneid*, the poet Virgil portrayed the rise of the Roman Empire as the preordained culmination of history's momentum. Yet, as the 18th-century historian Edward Gibbon chronicled in *The History of the Decline and Fall of the Roman Empire*, the seeds of Rome's annihilation were sown long before its decline. Factors such as hubris, moral decay, overexpansion, corruption, and political instability ensured that, even at the height of its power, the empire was headed toward self-destruction.

Like ancient Rome, the history of life on Earth has been shaped by its own triumphant, yet catastrophic, Darwinian narrative. Today, more than 99% of species that have ever existed are now extinct (1). And despite our belief in human exceptionalism, *Homo sapiens* seems no more immune to the patterns of history than other species.

In his bold and insightful *The Decline and Fall of the Human Empire*, paleontologist Henry Gee presents a sobering vision of humankind's future, as intriguing as it is unsettling. Despite our technological prowess and capacity for imagination, he argues, *Homo sapiens* is "marked for extinction."

The rot, he suggests, set in when we hunted down and extinguished Neanderthals, Denisovans, and the diminutive "hobbit men" *Homo floresiensis* and *Homo luzonensis*. Suddenly, we had no competition, something as necessary for success as the "irritating grit in an oyster" that creates a pearl.

This was compounded by the invention of agriculture around 12,000 years ago and the selective breeding of high-yielding crops during the Green Revolution of the 1980s. The former transformed a dispersed species of hunter-gatherers—perpetually teetering on "the edge of oblivion"—into a global population of billions. The latter allowed humanity to defy biologist Paul Ehrlich's apocalyptic predictions that the unchecked increase in global population would outstrip Earth's resources, resulting in widespread famine (2).

But, Gee argues, progress cannot be indefinitely sustained. While postponing disaster, the Green Revolution and other efforts, such as using genetic engineering to rewrite crop

genomes, are unlikely to avert it. We face an impending food security crisis.

Other potential threats to human existence range from nuclear and biological warfare, greenhouse gas-induced climate change, and artificial general intelligence (AGI) to pandemics, volcanic eruptions, and asteroid impacts. But the most immediate threat is the loss of global habitats. Even moderate loss may lead to an "extinction debt," causing the eventual "extinction of the dominant competitor in remnant patches" (3). Unfortunately, the "dominant competitor" in this scenario is humankind.

The astonishing creativity of humans relies on their vast populations. As Gee notes, "it takes a civilization of billions to create an



Human development threatens critical habitats and may eventually undermine our own existence.

Einstein." Yet, following an uninterrupted period of expansion, humankind now faces the prospect of transitioning to a phase of population decline. A significant milestone occurred in 2022, when, for the first time, more people died in China than were born. A similar trend is occurring in countries such as Japan, Thailand, Italy, and Spain.

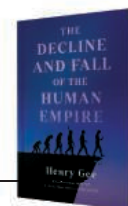
The solution to this impending population calamity, Gee argues, is for humankind to expand its domain through the colonization of, and evolutionary diversification on, the Moon, Mars, and other planetary bodies. In so doing, Gee believes humans can rekindle the migratory wanderlust of their ancestors, using their intellectual ability to devise solutions for survival in hostile environments.

Although this vision is inspiring, some

The Decline and Fall of the Human Empire: Why Our Species Is on the Edge of Extinction

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near-term issues appear at odds with its feasibility. The eventual attainment of AGI, for example, would likely reduce the need for flesh-and-blood Einsteins, allowing innovation in more-modest human populations. And while Gee advocates diverting resources to space travel and artificial ecosystems, many might argue that they would be better deployed on conservation and engineering biology to generate sustainable systems.

Moreover, fostering the evolution of new posthuman species would not inevitably favor *Homo sapiens*. And, were we to acquire the ability to send humans to distant planets, it is unlikely that the colonies would be disconnected, as required for speciation. More optimistically, the impending reduction in

the global population may help attain the audacious rewilding goals espoused by the late biologist E. O. Wilson (4).

Edward Gibbon believed that the principal cause of the Roman Empire's fall was the cultural shift invoked by Christianity. Perhaps an ideological shift will precipitate humanity's decline. Whatever the cause of our eventual demise, Gee's pessimistic predictions about our fate offer much to consider. ■

REFERENCES AND NOTES

1. D. Jablonski, *Nature* **427**, 589 (2004).
2. P. Ehrlich, *The Population Bomb* (Ballantine Books, 1968).
3. D. Tilman, R. M. May, C. L. Lehman, M. A. Nowak, *Nature* **371**, 65 (1994).
4. E. O. Wilson, *Half-Earth: Our Planet's Fight for Life* (Liveright Publishing Corp., 2016).

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