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E.O. Wilson, a Pioneer of Evolutionary Biology, Dies at 92

A Harvard professor for 46 years, he was an expert on insects and explored how natural selection and other forces could influence animal behavior. He then applied his research to humans.



In a never-before-seen interview, E.O. Wilson sat down with The New York Times in 2008 to talk about his lifelong quest to explore and to protect the planet's biodiversity. Kayana Szymczak for The New York Times

[link to NYT article and 11 min. video](#)



By **Carl Zimmer**

Dec. 27, 2021

Edward O. Wilson, a biologist and author who conducted pioneering work on biodiversity, insects, and human nature — and won two Pulitzer Prizes along the way — died on Sunday in Burlington, Mass. He was 92.

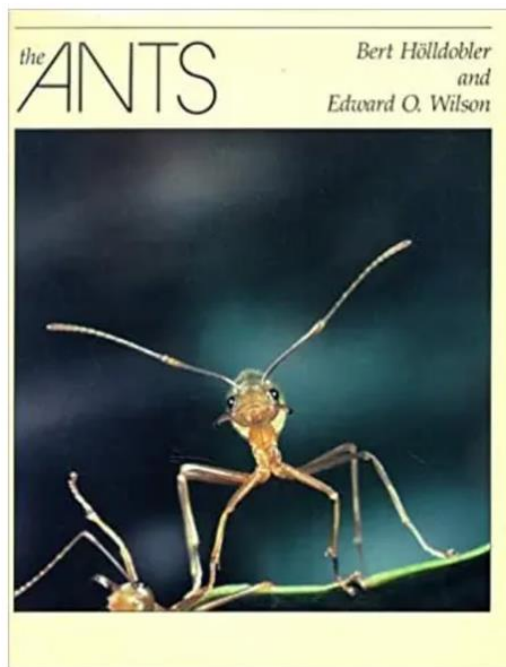
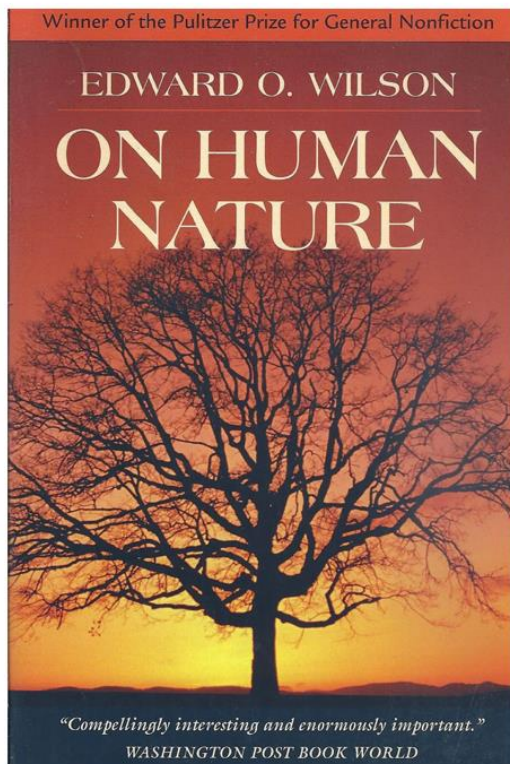
His death was [announced on Monday by the E.O. Wilson Biodiversity Foundation](#).

When Dr. Wilson began his career in evolutionary biology in the 1950s, the study of animals and plants seemed to many scientists like a quaint, obsolete hobby. Molecular biologists were getting their first glimpses of DNA, proteins and other invisible foundations of life. Dr. Wilson made it his life's work to put evolution on an equal footing.

“How could our seemingly old-fashioned subjects achieve new intellectual rigor and originality compared to molecular biology?” he recalled in 2009. He answered his own question by pioneering new fields of research.

As an expert on insects, Dr. Wilson studied the evolution of behavior, exploring how natural selection and other forces could produce something as extraordinarily complex as an ant colony. He then championed this kind of research as a way of making sense of all behavior — including our own.

As part of his campaign, Dr. Wilson wrote a string of books that influenced his fellow scientists while also gaining a broad public audience. “On Human Nature” won the Pulitzer Prize for general nonfiction in 1979; “The Ants,” which Dr. Wilson wrote with his longtime colleague Bert Hölldobler, won him his second Pulitzer, in 1991.



Dr. Wilson also became a pioneer in the study of biological diversity, developing a mathematical approach to questions about why different places have different numbers of species. Later in his career, he became one of the world's leading voices for the protection of endangered wildlife.

Dr. Wilson, a professor for 46 years at Harvard, was famous for his shy demeanor and gentle Southern charm, but they hid a fierce determination. By his own admission, he was “roused by the amphetamine of ambition.”

His ambitions earned him many critics as well. Some condemned what they considered simplistic accounts of human nature. Other evolutionary biologists attacked him for reversing his views on natural selection late in his career.

But while his legacy may be complicated, it remains profound. “He was a visionary on multiple fronts,” Sarah Blaffer Hrdy, a former student of Dr. Wilson’s and a professor emerita at the University of California, Davis, said in a 2019 interview.

As Paula J. Ehrlich, chief executive and president of the E.O. Wilson Biodiversity Foundation, put it: “His courageous scientific focus and poetic voice transformed our way of understanding ourselves and our planet.”

An Early Discovery

Edward Osborne Wilson was born in Birmingham, Ala., on June 10, 1929. His father, Edward Osborne Wilson Sr., worked as an accountant. His mother, Inez Linnette Freeman, was a secretary. They divorced when their son was 8.

As his parents’ marriage disintegrated, he found solace in forests and tidal pools. “Animals and plants I could count on,” Dr. Wilson wrote in his 1994 memoir, “Naturalist.” “Human relationships were more difficult.”

One day, as he was casting a fishing line, he pulled too hard when he caught a pinfish, it flew into his face, and one of the spines on its fin pierced his right eye, leaving him partly blind. “The attention of my surviving eye turned to the ground,” Dr. Wilson wrote. He developed an obsession with ants — one that would last his entire life.

Uncovering logs and discovering ant nests felt to him like exposing a strange netherworld. In high school, he discovered the first colony of imported fire ants in the United States — a species that went on to become a major pest in the South.

At the time, he was also undergoing a spiritual transformation. Raised as a Baptist, he struggled with prayer. During his baptism, he became keenly aware that he felt no transcendence. “And something small somewhere cracked,” Dr. Wilson wrote. He drifted away from the church.

“I had discovered that what I most loved on the planet, which was life on the planet, made sense only in terms of evolution and the idea of natural selection,” Dr. Wilson later told the historian Ullica Segerstrale, “and that this was a far more interesting, richer and more powerful explanation than the teachings of the New Testament.”

Edward O. Wilson (1929-2021)

A Harvard professor for 46 years, Wilson was an expert on insects and explored how natural selection and other forces could influence animal behavior.

- **Obituary:** E.O. Wilson conducted pioneering work on biodiversity, insects and human nature and [won two Pulitzer Prizes along the way.](#)
- **The Last Word:** E.O. Wilson on his [lifelong quest to explore and to protect the planet’s biodiversity.](#)
- **Biography:** Wilson [focuses on the smallest details in nature](#) and recognizes their connections to ecosystems in “Scientist,” a biography by Richard Rhodes.
- **Q. and A.:** An interview with Wilson on his favorite books, how he preferred to read and [who he would invite to a dinner party.](#)

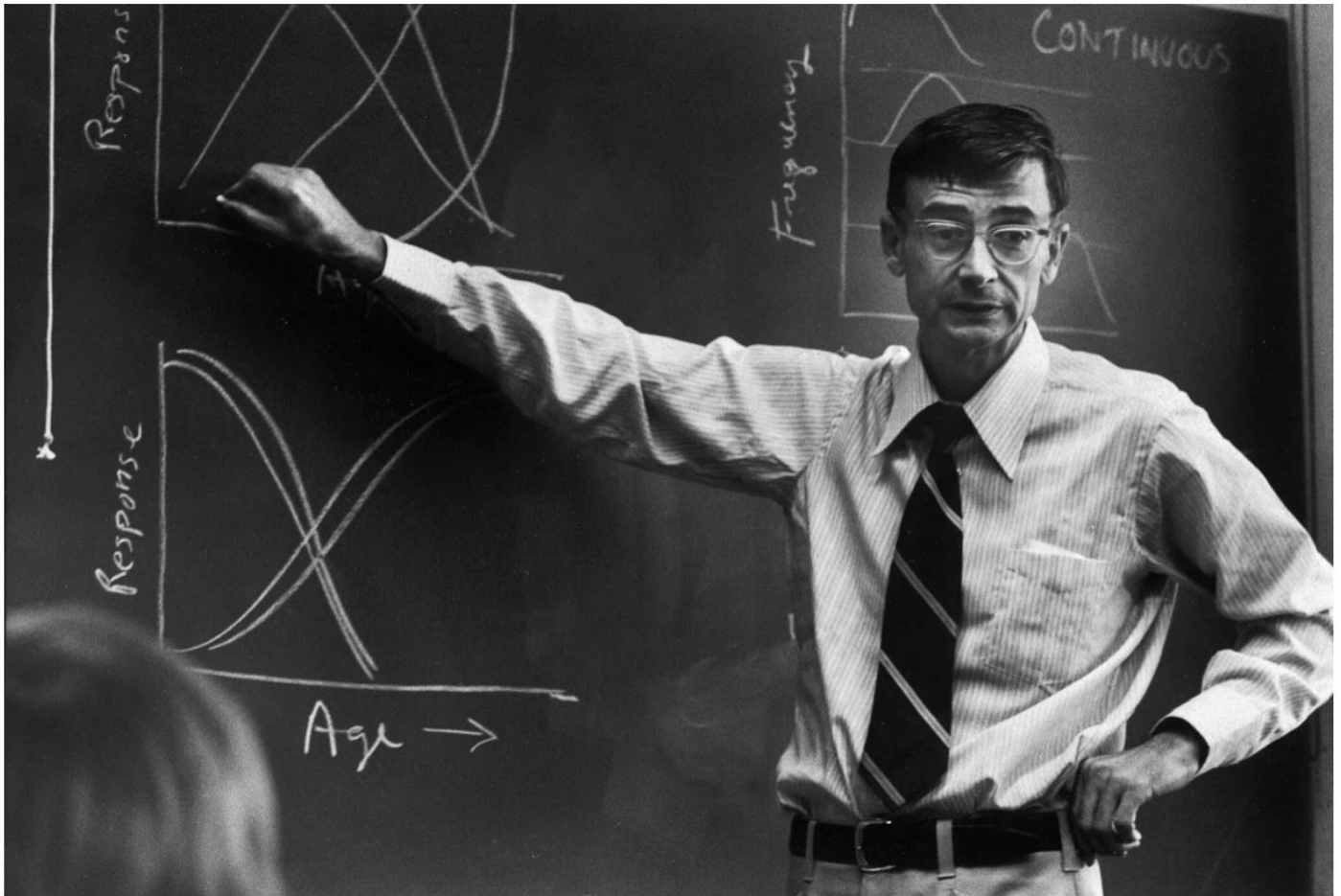
Dr. Wilson earned bachelor’s and master’s degrees in biology at the University of Alabama, where he studied dacetine ants, a species native to the American South. “They are under the microscope among the most aesthetically pleasing of all insects,” he later wrote in his memoir.

In 1950, Dr. Wilson went to Harvard to earn his Ph.D. To further his graduate work, he embarked on a long journey in 1953 to explore the global diversity of ants, starting in Cuba and moving on to Mexico, New Guinea and remote islands in the South Pacific.

Among other things, Dr. Wilson studied the geographical ranges of ant species, looking for clues to how they spread from place to place, and how old species gave rise to new ones. “Evolutionary biology always yields patterns if you look hard enough,” he wrote.

Returning from his travels, Dr. Wilson married Irene Kelley of Boston, to whom he had become engaged before his departure. She died in August. He is survived by their daughter, Catherine I. Gargill.

Dr. Wilson joined the Harvard faculty in 1956. As a new professor, he quickly began pursuing a number of scientific questions at once. In one line of research, he searched for a theory that could make predictions about the diversity of life. In 1961, he found the perfect partner for this work: Robert MacArthur, a biologist then at the University of Pennsylvania.



Hugh Patrick Brown/Getty Images

Together they developed equations to predict how many species a given island should have. Bigger islands could support more species than smaller ones, for example. They also argued that islands closer to the mainland would receive an influx of more species.

To test the idea, Dr. Wilson and one of his graduate students, Daniel Simberloff (now a professor at the University of Tennessee), ran an experiment on tiny mangrove islets, some just a few feet across, in the Florida Keys.

They covered the islets in tents and fogged them with short-acting pesticides, and then picked off the land snails by hand. The islets soon bounced back to their previous equilibria, with more species returning to the near-shore islets than the distant ones.

Dr. Wilson and Dr. MacArthur published a book about their idea, “The Theory of Island Biogeography,” in 1967. It became arguably the most influential published work in ecology. “It is a true landmark among landmarks,” the ecologist [Robert May](#) wrote in 2009.

“The idea has such vitality,” Stuart Pimm, a conservation biologist at Duke University, said in a 2019 interview. “There are all sorts of interesting things that we can test, inspired by that idea.”

Dr. Pimm and other researchers found they could use the theory of island biogeography to make predictions about diversity in lakes, forests and other habitats. And the destruction of habitats, in effect, created island-like fragments. Dr. Wilson and Dr. MacArthur’s theory allowed researchers to predict how many extinctions would follow. Dr. Pimm called their work “a founding principle of conservation biology.”

Plunging Into Controversy

As Dr. Wilson was developing the theory of island biogeography, he was also investigating another deep question: How did the behaviors of different species evolve?

Ants were a good place to start addressing that question. Dr. Wilson and his colleagues studied how ants released chemicals from their glands to trigger other members of their colony to take on new jobs.



Hugh Patrick Brown/Getty Images

Dr. Wilson found it hard to explain ant behavior in terms of natural selection, which alters a species as some individuals have more offspring than others. Ants are deeply cooperative — so much so that a queen ant's daughters are typically sterile, sacrificing their own reproductive success for hers.

He found an answer — for a time, at least — in the work of William Hamilton, a British graduate student. Mr. Hamilton argued that biologists needed to focus less on individual animals and more on their genes.

The females in an ant colony were all the daughters of the queen. By caring for the queen's offspring, they could pass down more of the genes they shared in common.

Mr. Hamilton described “inclusive fitness,” as this concept came to be known, in a 1963 paper. Dr. Wilson took the paper on a long train ride from Boston to Miami. At the start of the journey, he was skeptical; by the end he was convinced.

“I was a convert, and put myself in Hamilton's hands,” Dr. Wilson wrote.

Dr. Wilson — a self-described “congenital synthesizer” — began drawing together the theoretical work by researchers like Mr. Hamilton with his own vast knowledge of insect behavior into a single book, “The Insect Societies,” published in 1971.

If he could explain the behavior of ants, Dr. Wilson reasoned, he ought to be able to explain the behavior of other animals: iguanas, newts, sea gulls — maybe even people. Dr. Wilson and like-minded colleagues came to refer to this project by a word that had been floating around the animal-behavior world since the 1950s: sociobiology. In 1975, Dr. Wilson published “Sociobiology: The New Synthesis.” It would become his most controversial book.

“The organism is only DNA's way of making more DNA,” Dr. Wilson brashly declared. He then explored a huge range of behaviors, showing how they might be the product of natural selection.

“It showed how this applies to virtually everything we see out there in the world of animal behavior, in a way that nothing had even come remotely close to doing,” Lee Dugatkin, an evolutionary biologist at the University of Louisville and the author of “Principles of Animal Behavior,” a widely used textbook, said in a 2019 interview.

At first, “Sociobiology” was showered with praise and attention. An article about it landed on the front page of The New York Times on May 28, 1975. In Scientific American, the Princeton biologist John Tyler Bonner called it “an extraordinary beginning.” Dr. Bonner wrote that Dr. Wilson “has identified and brought together in one tome all those elements that will be the ingredients of sociobiology in the future.”

Then, Dr. Wilson later recalled in his memoir, “Everything spun out of control.”

Dr. Wilson got in trouble for extending sociobiology to humans. He had invited his readers to consider how human nature might be shaped by evolutionary pressures. He warned them that this would not be easy: It would be hard to tease apart the effects of human culture from those of natural selection. Making matters worse, no one at the time had linked any genetic variant to any particular human behavior. “There is a need for a discipline of anthropological genetics,” he wrote.

Nevertheless, Dr. Wilson argued that our species had a propensity to behave in certain ways and form certain social structures. He called that propensity human nature.

Natural selection could help explain psychology, in other words. Human aggression, for example, may have been adaptive for early humans.

“The lesson for man is that personal happiness has very little to do with all this,” he wrote. “It is possible to be unhappy and very adaptive.”



Dr. Wilson in Manhattan in 2008. While he had a lifelong obsession with ants, discovering how they communicate through pheromones, he is most famous for the publication in 1975 of “Sociobiology: The New Synthesis,” which advanced evolutionary thinking. Tony Cenicola/The New York Times

Dr. Wilson's critics ignored these caveats. In a letter to *The New York Review of Books*, some denounced sociobiology as an attempt to reinvigorate tired old theories of biological determinism — theories, they claimed, that “provided an important basis for the enactment of sterilization laws and restrictive immigration laws by the United States between 1910 and 1930 and also for the eugenics policies which led to the establishment of gas chambers in Nazi Germany.”

In her book “*Defenders of the Truth*” (2000), Dr. Segerstrale wrote that Dr. Wilson's critics had shown “an astounding disregard” for what he had written, arguing that they had used “Sociobiology” as an opportunity to promote their own agendas. When Dr. Wilson attended a 1978 debate about sociobiology, protesters rushed the stage shouting, “Racist Wilson, you can't hide, we charge you with genocide!” A woman dumped ice water on him, shouting, “Wilson, you are all wet!”

After drying himself off with paper towels, Dr. Wilson went ahead and gave his speech.

In that speech and elsewhere, Dr. Wilson declared that sociobiology offered no excuse for racism or sexism. He dismissed attacks against him as “self-righteous vigilantism.” And he went on to dig even deeper into the evolution of human behavior.

The legacy of “Sociobiology” was profound for researchers who study animals. “It was liberating,” Karen Strier, a primatologist at the University of Wisconsin-Madison and the president of the International Primatological Society, said in an interview. “You can study all animals with the same basic perspective.”

Animal behavior today is “95 percent sociobiology,” said Dr. Hrdy, who, after studying with Dr. Wilson at Harvard, went on to publish influential studies about how female primates behave in subtle, complex ways to increase their reproductive success. “No one could have been more supportive than Wilson of this stuff,” she said.

But some scientists found just the opposite. Among them was Deborah Gordon, a leading expert on ants at Stanford University.

“Wilson's view of how an ant colony works had every ant genetically programmed to do a certain thing,” Dr. Gordon said in a 2019 interview. “He wanted everybody to do what they were supposed to do without any mess.”

In her own research, Dr. Gordon found that ants can switch from one job to another. And they do not respond to any particular chemical signal like little robots; instead, they will respond differently under different circumstances. “The process is messy,” Dr. Gordon said.

Dr. Wilson vigorously attacked Dr. Gordon's work, both in print and in person. When Dr. Gordon was at Harvard in the mid-1980s on a fellowship, she recalled Dr. Wilson standing up in the middle of one of her talks to shout his objections. "He really made a lot of effort to keep me from getting a job," she said.

Dr. Wilson's legacy for the study of human nature is an unfinished story. In the decades since "Sociobiology," researchers have pinpointed thousands of genes that have an influence on variations in human behavior. Humans share many of these genes with other species, and they influence behavior in those animals as well.

Some researchers have tried to construct elaborate evolutionary accounts for how individual genes helped give rise to human nature. But again and again, many of these explanations have proved to be simplistic to the point of misleading. Scientists are a long way from Dr. Wilson's dream of an evolution-based account of human nature.

A Busy Retirement

In the 1980s, Dr. Wilson began the third great project of his career, as a champion of the world's wild places. By then, his earlier work on island biogeography was taking on a terrifying new importance. As humankind reduced rain forests and other habitats to fragments, countless species were being pushed toward extinction.

Dr. Wilson took up the dangers of extinction in his best-selling 1992 book, "The Diversity of Life."

Dr. Wilson wove accounts of his travels in the tropics with the latest understanding about humanity's impact on the biological richness of the planet. "Earth has at last acquired a force that can break the crucible of biodiversity," he wrote.

Dr. Wilson retired from Harvard in 2002 at age 73, although that transition is hard to recognize from his résumé. After stepping down, he published more than a dozen books, including a digital biology textbook for the iPad.

Retirement did not stop him from championing new ideas, including some that outraged many of his colleagues. In 2010, he turned against inclusive fitness, [publishing a paper](#) attacking the concept with Martin A. Nowak of Harvard and Corina E. Tarnita, now at Princeton. Dr. Wilson later popularized their argument in his 2012 book, "The Social Conquest of Earth."



Even after retiring in 2002, Dr. Wilson, seen here in 2012, wrote more than a dozen books. In one, he argued that other forms of evolution could explain some types of behavior, backing away from his earlier position. Richard Perry/The New York Times

“The basic foundations of inclusive fitness theory are unsound,” Dr. Wilson said in a 2012 interview. Instead, he and his colleagues argued, biologists should look to other forms of evolution to explain altruism and other puzzling forms of behavior. Natural selection acting on individuals could explain some; it was possible that groups of animals could be selected as well.

To many scientists who were profoundly influenced by Dr. Wilson’s earlier work, his reversal was disappointing. “It was not the way things should be done, and it was not good science,” Dr. Dugatkin said. He and nearly 150 other evolutionary biologists signed a letter declaring that Dr. Wilson’s arguments were “based upon a misunderstanding of evolutionary theory and a misrepresentation of the empirical literature.”

Richard Dawkins, a leading exponent of inclusive fitness, ruthlessly attacked Dr. Wilson in a review of “The Social Conquest of Earth,” which he said was full of “downright perverse misunderstandings.”

Dr. Wilson dismissed his critics, likening them to early astronomers who came up with elaborate explanations to support their idea that the sun and planets revolved around the earth. Dr. Dawkins called Dr. Wilson’s response “an act of wanton arrogance.”

In retirement, Dr. Wilson continued to use his fame to draw attention to biodiversity. In 2008 he unveiled the [Encyclopedia of Life](#), a website that will eventually house information about every known species.

Dr. Wilson continued to warn of the dangers of an impending mass extinction, but he did not consider the planet doomed. “I’m optimistic,” he said in an interview in 2012. “I think we can pass from conquerors to stewards.”

To draw attention to successes in saving species, Dr. Wilson traveled to distant parts of the world in his 80s. In 2014, he published “A Window on Eternity,” about his trip to Gorongosa National Park in Mozambique.



Dr. Wilson in the woods of Walden Pond Reservation in Concord, Mass., in 2002. He argued that leaving half the earth wild was the only way to avoid mass extinction. James Gorman/The New York Times

To save biodiversity, Dr. Wilson called for a world of Gorongosas. In his 2016 book, “Half-Earth: Our Planet’s Fight for Life,” he argued that the only way to avoid a mass extinction would be to leave half the earth wild.

“It’s a grand, wonderful aspiration,” Dr. Pimm said.

Like so many of Dr. Wilson’s ideas, it spurred other scientists to do more research of their own. In 2018, Dr. Pimm and his colleagues published a study showing that a careful plan for deciding which places to preserve could make Dr. Wilson’s vision a reality.

“We’re taking Ed’s idea and running with it,” Dr. Pimm said. “It’s that simple.”

Derrick Bryson Taylor contributed reporting.

Carl Zimmer writes the [“Matter”](#) column. He is the author of fourteen books, including “Life’s Edge: The Search For What It Means To Be Alive.”