BOOK REVIEWS

The Right Stuff

Naturalist. EDWARD O. WILSON. Island Press/Shearwater Books, Washington, DC, 1994. xiv, 380 pp., illus., + plates. $24.95.

With such intense competition for resources and glory, are there any heroes in the crowded arenas of modern science? In 1971, fresh out of the army and eager to start graduate work, I read James D. Watson's *The Double Helix* with mixed feelings. Unraveling the secrets of molecular genetics was awe-inspiring, even for those of us obsessed with whole organisms, yet the behavior of some players in the DNA story seemed ruthless and shabby if not outright dishonest. Nevertheless, I often recommend Watson's book to students so that they too will ponder the roles greed and fame might play in our careers. Now with *Naturalist* we can contemplate the proud and candid autobiography of another great biologist. Edward O. Wilson's accomplishments include major breakthroughs in the understanding of chemical signaling, biogeography, and social behavior, as well as tireless promotion of nature conservation. He has received two Pulitzer Prizes, the National Medal of Science, the Crafoord Prize of the Royal Swedish Academy of Sciences, the International Prize for Biology from the Emperor of Japan, and an award for distinguished undergraduate teaching. Wilson wrote this book to "clarify the elements at the core of my beliefs to you and to myself, and perhaps to persuade."

Part 1 (Daybreak in Alabama) recounts Wilson's life from childhood through graduate school at Harvard. He grew up in an Old South of military academies and schoolyard fistfights, a time when and a place where young men aspired to be gridiron stars and soldiers, not professors. Blinded in one eye by a fishing accident at age seven, "Snake" (so nicknamed because of a penchant for reptiles) was shy and slight of build and wanted to be a regular guy. Young Ed's most memorable triumph as a high school freshman, however, was to kill 20 flies during a class and leave them in neat rows for the next student. Undersized and ever more introverted, he played in only one high school football game. World War II heralded a period of intense hero worship in the United States, and if distant galaxies had caught his fancy Wilson might have dreamed of space travel. Instead, he found solace in nature, the one constant for a nomadic youth with an insecure home life, and prowled the swamps and coastal strands of Florida and Alabama; he watched jellyfish, ants, and snakes while imagining far-away jungles and previously unclimbed mountains. Trips to the Smithsonian and the National Zoo cemented his career path in biology.

Wilson's upbringing is recounted in graceful, evocative prose, without self-pity or pretense. He writes movingly about his father's alcoholism and eventual suicide, about his own deep-rooted and complex emotional attachment to religion. There are vivid memories of drinking Royal Crown Cola while sitting on an old bridge, his teenage uncertainties reflected in languorous green waters, and the insightful recollection that animals seem larger when we are small. Wilson describes earnest pride in having been a Boy Scout, tempered by that group's failure to address two highly charged topics: Teenagers of the time skirted the subject of normal sexual encounters, of which they were taught nothing, with vulgar language and endless speculation about abnormal behavior; donning his Eagle Scout regalia to address poor rural kids about the joys of scouting, Wilson felt overwhelming shame that racial inequities would deny them his advantages.

Left, Edward O. Wilson, "devoted to entomology at the age of thirteen, collects insects in a vacant lot next to his Mobile, Alabama, home, in the summer of 1942." *Right*, Wilson and Bert Hölldobler in 1990, at the time of publication of *The Ants*. [From *Naturalist*; first photograph by Ellis MacLeod]

Part 2 (Storyteller) deals with Wilson's formal career, launched at a time when evolutionists focused on speciation, ecologists were preoccupied with contemporary local processes, and ethology was still gaining momentum in Europe. He rightly claims some credit for the ongoing rapprochement of these fields, in chapters packed with incisive vignettes of key events and personalities in 20th-century science. There is the coleopterist Philip J. Darlington's terrifying run-in with a crocodile; there are hilarious encounters with imperious molecular biologists and a notoriously taciturn paleontologist. The contentious interplay between theory and empiricism is richly portrayed, and at one point Robert H. MacArthur, the coframer with Wilson of island biogeographic theory, complains, "I think I can tell why there are potatoes in the field and where they lie, but these people say no good, they want to know the size and shape of the potatoes." There are accounts of how the work is done, and Wilson's beloved ants trail through it all. As he searches for their tiny abdominal glands, small tremors in his arms become part of a dissection technique; during studies of chemical communication, his lab smells like "essences of sewer, garbage dump, and locker room." And clearly the famous mangrove island experiments with Daniel Simberloff were logistically far more remarkable than was ever expressed in journal papers.

Two chapters trace Wilson's efforts to unify population biology, individual behavior, and culture, a period in his professional life that led to three major books and sparked extensive debate over the applicability of evolutionary biology to modern humans. Some important figures in the growth of sociobiology are not mentioned, but then this book is about Wilson, not an exhaustive trea-

Vignettes: Thanksgiving Advisory

The utilization of large tom turkeys for roasting is not practical in many homes in the United States. The chief outlet is to the hotel and restaurant trade. However, by devising several variations of turkey processing, which are presently in use in the industry, investigators have widened the market for large toms, thus keeping their price more in line with hen turkeys, which are more desirable for the average family. . . .

The sale of cut-up turkey has been somewhat retarded because some consumers have the impression that turkey must be roasted whole. However, the roasting of half turkey with the dressing underneath has been well received, and the roasting of quarter turkey is convenient for small families.

The carving platter should be of ample size (it is embarrassing to serve cuts from the tablecloth or the lap). . . .

If a piece of meat will not hold together, or if it desires to run a race around the platter, the carver should continue to work swiftly and quietly, without condemning the meat, or the cook, or his or her own shortcomings as a carver.

—*John R. Romans, William J. Costello, C. Wendell Carlson, Marion L. Greaser,* and *Kevin W. Jones,* in *The Meat We Eat* (13th edition; Interstate Publishers)

tise. There are riveting descriptions of his "brilliant adversary" Richard C. Lewontin, and Wilson's reflections on the controversy will benefit historians and philosophers. Dismissing as inconsequential the famous incident in which protesters gained a stage and dumped water on him, he blames much of the overall tumult on his failure to anticipate the ideological significance of what was for him a purely intellectual quest. With only a nod to external factors, Wilson still insists that heredity plays a heavy hand in our individual destinies, evidenced by everything from cross-cultural similarities to his own limitations as a long-distance runner. His complete and unwavering faith in reductionism is, he asserts, at the heart of the conflict with Lewontin. Wilson believes that his work with Charles J. Lumsden on gene-culture coevolution has not yet borne full fruit and is confident that someday others will vindicate them. Although academic freedom and scientific responsibility are scarcely mentioned explicitly, these chapters provide rich material for exploring such troubling issues.

By his own words, Edward O. Wilson emerges as a reclusive yet passionate man with obvious warmth for those within his circle. He finds intrigue and humor in the travails of field biology, from rooming next to a noisy New Caledonian prostitute to eating the nut-flavored grubs of a beetle in New Guinea. He has mild arachnophobia and a fear of crippling accidents in far away places. Back from ten months of fieldwork, he falls into his sweetheart's arms at the Boston train station and soon recovers American culture by gorging on hamburgers and "hours of serious television watching." Heavily influenced by teachers in early life, Wilson is especially pleased to later repay their own children with kindness. He feels strongly about motives and values ("There is no finer sight on green Earth than a defeated bully") and places "great store in civility and good manners . . . scarce among the often hard-edged, badly socialized scientists with whom I associate." Altruism and devotion to duty "exist independently of approval and validation," and Wilson is "brought to tears with embarrassing quickness [by ceremonies honoring] the strength of ordinary people . . . that held civilization together in dangerous times."

Motivations swirl and evolve throughout this man's life. As a kid, he found science so much fun he wondered why everyone didn't want to be a biologist; much later he speaks of the need to "enjoy once again the hands-on kinesthetic pleasures of my youth." Wilson is incorrigibly disciplined, however, and by age 13 he was a "child workaholic." By young adulthood his ambition is white-hot, likened to an amphetamine, and he alludes to hubris that "fester[s] in my soul." Emotional consequences swing from "dark periods" and even depression to sleepless exhilaration over the discovery of new organisms and previously unknown patterns in nature. His route to success is "to probe in all directions and learn where one's abilities are exceptional, where mediocre, where poor, then fashion tactics and prostheses to achieve the best possible results." He advises, "Look for [disciplines] still thinly populated, where fine differences in raw abilities matter less. Be a hunter and explorer, not a problem solver. Perhaps the strategy can never work for track, with one distance and one clock. But it serves wonderfully well at the shifting frontiers of science." Wilson believes that enemies and adversaries sharpen and challenge us, inspiring greater accomplishments.

The last chapter of *Naturalist* details what might prove to be Wilson's most important and enduring legacy, his outspoken support for biodiversity and conservation, even before that was a bandwagon among academic biologists. Here, as in previous books, Wilson is the grand master of lyrically analytic nature writing: "Dacetines are slender, ornately sculptured little ants with long, thin mandibles. Their body hairs are modified into little clubs, scales, and sinuous whips. In many species a white or yellow spongy collar surrounds their waists." The surprising ending to this chapter, essentially a coda for the book, emphasizes Wilson's peerless ability for enlarging our perceptual realms, making tangible things otherwise too vast or too small. Who else would tell us that one gallon of fire ant pheromone might summon forth the inhabitants of 10 million colonies or that the roughly 1 to 10 million billion living ants weigh as much as the sum total of humanity? Now he longs for another lifetime and turns toward a world ever more obscure and infinitely complex. No minimalism there either, certainly no timid theories, just more relentless pursuit of big discoveries.

At a time when the practice and role of science are under increasing scrutiny, Edward O. Wilson's stunning autobiography warrants widespread attention. Of course heroes are always in the eye of the beholder, and they are never free from flaws, but Wilson is as forthright about personal shortcomings as he is proud of some remarkable achievements. Winning has been terribly important (perhaps, he muses, too much so at times), but never at the expense of certain standards of conduct; this biologist is unfailingly generous with praise for his collaborators and readily credits the discoveries of others. *Naturalist* is a fine read, told with uncommon insight and poignancy, and I found much to admire in his story.

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