

Notes and References

CAVEAT: *The Dangers of Behavioral Biology*

The contents of this book are known to be dangerous.

I do not mean that in the sense that all ideas are potentially dangerous. Specifically, ideas about the biological basis of behavior have encouraged political tendencies and movements later regretted by all decent people and condemned in school histories. Why, then, purvey such ideas?

Because some ideas in behavioral biology are true—among them, to the best of my knowledge, the ones in this book—and the truth is essential to wise action. But that does not mean that these ideas cannot be distorted, nor that evil acts cannot arise from them. I doubt, in fact, that what I say can prevent such distortion. Political and social movements arise from worldly causes, and then seize whatever congenial ideas are at hand. Nonetheless, I am not comfortable in the company of scientists who are content to search for the truth and let the consequences accumulate as they may. I therefore recount here a few passages in the dismal, indeed shameful history of the abuse of behavioral biology, in some of which scientists were willing participants.

The first episode is recounted in William Stanton's *The Leopard's Spots: Scientific Attitudes Toward Race in America, 1815–59* (Chicago: University of Chicago, 1960). Such names as Samuel George Morton, George Robins Gliddon, and Josiah Clark Nott mean little to present-day students of anthropology, but in the difficult decades between the death of Jefferson and the Civil War, they founded the American School of Anthropology. This movement dedicated itself to proving the inevitable separate status of the races and to placing white supremacy on a scientific foundation. They attempted to do this through the study of skulls and brain volume, combined with some "obvious" observable facts of behavior and custom—"niggerology," as one of them privately called it (Stanton, *The Leopard's Spots*, p. 161). In its more dignified public guise it was called "polygenism," a reference to the supposed separate evolutionary origins of various races. (This, incidentally, was a view that Jefferson and his intellectual circle had rejected.) Two of the three (Morton and Nott) were physicians, but their conjectures were based on so little and such silly "evidence" that it is puzzling how they succeeded.

Yet succeed they did. When they came on the scene in the early part of the nineteenth century, the views of Samuel Stanhope Smith, according to which humankind had a single origin and a single biological plan, held sway. It was the view taken by Thomas Jefferson and his circle (see Daniel Boorstin, *The Lost World of Thomas Jefferson*, Chicago: University of Chicago, 1981) and is universally accepted today. But thanks to the efforts of the American School, by the 1850s the unity of humankind was an idea

effectively dislodged from favor, linked to atavistic, religious, antiscientific sentimentalism. Miscegenation was viewed as a threat to civilization, and slavery as the logical lot of the Negro. Now no one would suppose the Civil War to have been caused by a handful of anthropologists; but they were highly respected and popular writers and lecturers, and it cannot be doubted that they deceived many. Meanwhile, their counterparts in Britain, France, and Germany laid a foundation for scientific racism that would stand firm for about a hundred years (Marvin Harris, *The Rise of Anthropological Theory*, New York: Thomas Y. Crowell, 1968, ch. 4).

The second episode involved Social Darwinism, some of which was in fact pre-Darwinian. It is recounted by George Stocking, in chapter 6, "The Dark-Skinned Savage: The Image of Primitive Man in Evolutionary Anthropology," of *Race, Culture and Evolution: Essays in the History of Anthropology* (New York: Free Press, 1968) and by Marvin Harris in chapter 5, "Spencerism," of *The Rise of Anthropological Theory*. In the latter part of the nineteenth century, most social theory was "evolutionary," but in nothing like the modern sense. Leaders of social and cultural anthropology, like Lewis Henry Morgan and Edward Tylor, although they greatly admired the "primitive" tribes and races they studied, nevertheless viewed them hierarchically, with the "less developed" or "less complex" groups as essentially frozen relics of past epochs. Marx and Engels took over this view from Morgan and made little attempt to conceal their own patronizing attitude toward pre-industrial, especially pre-state peoples.

Darwin (see Stocking, *Race, Culture and Evolution*, p. 113) and his evolutionist predecessor Charles Lyell (see Harris, *Rise of Anthropological Theory*, p. 113) both predicted the extermination of the "savage" races by the civilized ones, and did not seem to shed any tears over the process. This in an era when some of their readers were doubtless pursuing that very extermination. Morgan and Tylor's hierarchical arrangements of social and cultural forms went along with explicit presumptions of a corresponding hierarchy of mental capacity; the more complex the civilization, the greater the native intelligence of its members. Progress through improvement was the inexorable motive force, and the pinnacle of progress was the civilization of Victorian England.

How comforting these ideas must have been to the representatives of that and similar civilizations just then engaged in the difficult work of subduing, enslaving, or, where necessary, exterminating those "primitive" peoples. It is not surprising that they were easily convinced, despite the lack of evidence. Herbert Spencer, the leading exponent of social evolution, cuts a rather sad figure against this background. Always claiming to be a friend of the poor, abhorring war and the greedy rape of the underdeveloped world, Spencer was viewed by many contemporaries, as well as by later scholars, as an apologist for the worst that was going on. He, not Darwin, coined the phrase "survival of the fittest" and justified the exploitation of the weak by the strong, on the grounds that the inevitable march of progress is only held back by humane intervention in the struggle for existence. Spencer explicitly apologized for the most unrestrained capitalism, and opposed socialism and all forms of social welfare. It is not difficult to imagine his words in the minds of the Robber Barons or of the legislators who voted against child labor laws. The progress of human decency in the nineteenth century was no doubt a complex matter, but it is logical to suggest that ideas about the biology of behavior retarded that progress. (On evolutionary theories of social behavior and their consequences, see Stephan Chorover, *From Genesis to Genocide*, Cambridge: MIT, 1979, ch. 5).

The third episode took place on both sides of the Atlantic between the beginning of World War I and the end of World War II. The American side of the episode is recounted in Daniel Kevles's *In the Name of Eugenics: Genetics and the Uses of Human Heredity* (New York: Alfred Knopf, 1985), and in the works by Kamin, Chorover, and Stocking cited

above. Although Alfred Binet, the French psychologist who originated IQ testing in 1905, had intended it as a device for identifying children who needed mental improvement through training, it began to be used a decade or so later in the United States for very different purposes. Under the auspices of Lewis Terman of Stanford and Robert Yerkes of Harvard—two leaders of American psychology—it was explicitly used to reduce immigration. Both these men believed that IQ was largely genetic, and they saw a chance to provide a much needed social service—giving the U.S. government a good excuse to stem the rising tide of immigration. Vast numbers of potential immigrants were labeled as retarded and sent away after taking intelligence tests in a language they did not understand.

Meanwhile, the behavior-genetic theories of the nineteenth century had crystallized in a clear eugenics movement in the United States. With the approval and encouragement of leading psychologists, compulsory sterilization laws were passed by the state legislatures of Pennsylvania, Indiana, New Jersey, Iowa, California, and Washington, providing for the “unsexing” of an impressive range of undesirables. In upholding the California law, the attorney general of California explicitly used the language of behavioral biology:

Degeneracy means that certain areas of brain cells or nerve centers of the individual are more highly or imperfectly developed than the other brain cells, and this causes an unstable state of the nerve system, which may manifest itself in insanity, criminality, idiocy, sexual perversion, or inebriety.

He went on to include “many of the confirmed inebriates, prostitutes, tramps, and criminals, as well as habitual paupers” in this class, all of whose members were potentially eligible for legal castration. *The Harvard Law Review* of December 1912—by which time all these state laws had been passed—argued that they would be constitutional, but only in the case of “born criminals” (Kamin, *I.Q.*, pp. 11–12).

Retrospective criticism of these lawyers and officials has been justifiably great, but they were influenced by psychologists, biologists, and physicians who gave them a false account of the facts. These experts provided what seemed to be definitive statements in a context fraught with uncertainty. They held out false hopes for great improvements in human welfare through eugenics, and rang loud, false alarms of racial degeneracy and eugenic disaster in the event that their advice was not followed.

Given these remarkable intellectual and legal developments in the United States, the parallel movements in Germany and elsewhere in Europe seem a bit less astounding. The ideas of eugenics and racial hygiene (*Rassenhygiene*) became respectable and established in German academic and medical discourse while Hitler was still a child. In 1895 the physician Alfred Ploetz wrote *The Excellence of Our Race and the Protection of the Weak*; in 1903 Wilhelm Schallmeyer won a national prize (given by the Krupp armaments family) for his *Inheritance and Selection in the Life-History of Nationalities: A Sociopolitical Study Based upon the Newer Biology*. *Politisch-Anthropologische Revue* and *Archiv für Rassen und Gesellschaftsbiologie* (Archive for Racial and Social Biology), two important scholarly journals concerned with eugenics and racial purity, began publication in 1902 and 1904, respectively. In 1920 a distinguished jurist, Karl Binding, and a distinguished psychiatrist, Alfred Hoche, published *The Release and Destruction of Lives Devoid of Value*, advocating large-scale, eugenic euthanasia.

It is critical to realize how very respectable these ideas were. They had nothing to do with brown shirts, breaking glass, goose-step marches, or diabolically energized mass rallies. They had only to do with respectable scientists, physicians, and lawyers communicating soberly through the usual means of discourse. Long before the Nazi party was founded, it was widely agreed that discoveries in social biology constrained scholars to certain

beliefs. Civilization was the result of genetic determinants, and its future depended on racial purity and the relentless elimination of the unfit from the gene pool.

This was not a national but an international phenomenon. In 1923, a year before the publication of Hitler's *Mein Kampf*, a director of health in Zwickau wrote to the German minister of the interior urging the enactment of a program of eugenic sterilization: "What we racial hygienists promote is not at all new or unheard of. In a cultured nation of the first order, the United States of America, that which we strive toward was introduced and tested long ago." Still skeptical, the interior minister pursued the matter through the German Foreign Office, and after receiving an extensive report became convinced. Through the legal and judicial example set by the United States, eugenics became respectable government business in Weimar, Germany (Chorover, *Genesis*, p. 98).

Daniel Goldhagen's comprehensive and chilling account of the perpetrators, *Hitler's Willing Executioners: Ordinary Germans and the Holocaust* (New York: Vintage/Random House, 1996), shows how deeply German culture was steeped in anti-Semitism, not just in the folkview but in the highest intellectual circles. Yet ideas about the role of the Jews in what might be called "racial history" were also current in international discourse. The English historian Houston Stuart Chamberlain had argued, in such works as *Foundations of the Nineteenth Century* (originally published in German) and *Race and Nation*, that the fall and rise of nations could best be understood by reference to the introduction and removal of Jews respectively. Chamberlain's work was widely discussed among German students from the time it was first published. (See Lucy S. Dawidowicz, *The War Against the Jews, 1933-1945* [New York: Holt, Rinehart & Winston, 1975] for discussion and references.)

Alfred Rosenberg, Hitler's advisor during the early years of the Nazi movement, called Chamberlain's work "the strongest positive impulse in my youth," and prepared excerpts of *Foundations of the Nineteenth Century* (*Grundlage des Neunzehn Jahrhunderts*) for Hitler's easy study (Dawidowicz, *War*, p. 20). Heinrich Himmler, later and throughout the war the head of the SS and a key figure in all concentration and killing operations, read *Race and Nation* (*Rasse und Nation*) at the end of 1921, and wrote of it in his diary: "It is true and one has the impression that it is objective, not just hate-filled anti-Semitism. Because of this it has more effect. These terrible Jews . . ." (Dawidowicz, *War*, p. 95). The last sentence is almost poignant; it makes clear that reading Chamberlain gave Himmler an added measure of conviction.

Are the scribblings of intellectuals about behavioral biology really important in causing great and destructive social movements? We don't know in every case, but the truth is poorly served by a smug conviction that they are not. Certainly the Nazis relied heavily on racial "science," and on physicians who studied and practiced it, for the justification of their program. As shown by Robert N. Proctor, in *Racial Hygiene: Medicine Under the Nazis* (Cambridge: Harvard University, 1988), racial theories and "research," emanating from official medical and scientific institutes and journals, was of the utmost importance in giving Nazism credibility. Doctors and public health officials were a central part of the program from the beginning, and were numerically as well as intellectually the professionals most supportive of Hitler. In addition to Proctor's account, see Michael Kater's *Doctors Under Hitler*, (Chapel Hill: University of North Carolina, 1989) and Robert Jay Lifton's *The Nazi Doctors: Medicalized Killing and the Psychology of Genocide* (New York: Basic Books, 1986/2000).

Many people wonder why the Jews did not try to get out. Of course, they did, in much larger numbers than were able to do so. The rising tide of immigration to the United States after World War I was in part due to the recognition by Jews and other Europeans of ominous signs on the horizon. As mentioned above, American psychologists helped to stem

this tide. Terman, Yerkes, and others, referring to very poor research, involved themselves in the perpetration of falsehoods that laid the foundation for a much more restrictive immigration policy, formulated in the Immigration Act of 1924 and other laws. A much-quoted study was Henry Goddard's report about IQ testing of immigrants at Ellis Island, which claimed that 83 percent of the Jews, 80 percent of the Hungarians, 79 percent of the Italians, and 87 percent of the Russians were "feeble-minded" (Kamin, *I.Q.*, p. 16). These statistics were due primarily to sloppy testing and language barriers. Robert Yerkes published the results of similarly poor, "confirmatory" research, under the auspices of the United States National Academy of Sciences, in 1921.

The result in immigration policy was formidable for many ethnic groups, but for Jews it was deadly. Because of the views of American psychologists and other behavioral biologists about the genetics of mental competence, many Jews were trapped in Europe, later to become Nazi victims. Speeches and writings by respected Americans like Henry Ford and Charles Lindbergh echoed the vicious anti-Semitism pervasive in Germany, but they would have had less credibility without the assent of scientists. (The definitive work on the Holocaust remains Raul Hilberg, *The Destruction of the European Jews*, New York: Holmes & Meier, Inc., 1985. See also Hilberg's *Perpetrators, Victims, Bystanders: The Jewish Catastrophe 1933-1945*, New York: HarperCollins, 1992; Lucy Davidowicz's *The War Against the Jews* and Daniel Goldhagen's *Hitler's Willing Executioners*, cited above; and Martin Gilbert's *The Holocaust: A History of the Jews of Europe During the Second World War*, New York: Holt, Rinehart & Winston, 1985.)

Incidentally, after 1920 the role of American anthropology in these intellectual currents became a very different, rather heroic one. (See Stocking's *Race, Culture and Evolution*, ch. 11, for details.) Franz Boas had established a new and completely different "American School" of anthropology, the main thrust of which was to break decisively with the racist and evolutionist past. He and his students (among them Alfred Kroeber, Ruth Benedict, and Margaret Mead) rejected all notions of cultural hierarchy, and Boas's book *The Mind of Primitive Man* broke down the notion that mental function was correlated with civilizational complexity. Anthropologists of the Boas school placed the concepts of culture and cultural relativism at the center of the field, stressing the dignity and independent validity of all ways of life.

In the arguments over IQ, race, and eugenics that raged during the 1920s and 1930s, they opposed the psychological testers and eugenicists, stressing the mounting evidence for cultural conditioning in all dimensions of ethnicity and for the universality of human mental functions. They traveled everywhere on earth searching for evidence, sifting and organizing it into a new science of culture. As Stocking put it:

In the long run, it was Boasian anthropology—rather than the racist writers associated with the eugenics movement—which was able to speak to Americans as the voice of science on all matters of race, culture, and evolution—a fact whose significance for the recent history of the United States doubtless merits further exploration. (*Race, Culture and Evolution*, p. 307)

But the taint of scientific racism lingered. Konrad Lorenz, who shared the Nobel Prize in medicine and physiology in 1973 for his work in behavioral biology, and who remained an active and distinguished investigator well into the 1980s, provided an uncomfortable link with the past. As noted by Leon Eisenberg (in "The Human Nature of Human Nature," *Science* 176 [1972], pp. 123-128) and by Chorover (in *Genesis*, pp. 104-105), Lorenz wrote an article in a scholarly journal in 1940, decrying miscegenation and racial impurity as leading to degeneracy in the genetically determined aspects of

behavior and character. And he explicitly praised the Nazi state for its accomplishments against this danger. Lorenz deeply regretted and retracted these statements. He also paid a high personal price for his support of the Reich, spending years in a Soviet prison camp after his capture on the eastern front. Yet the watchword should not be "forgive and forget" but perhaps something more like "forgive and remember."

Statements made by Arthur Jensen, William Shockley, and other investigators in the late 1960s and early 1970s about race and IQ or social class and IQ rapidly passed into currency in policy discussions. Many of these statements were proved wrong, but they had already influenced some policymakers, and that influence is very difficult to recant. The sociobiology of the late 1970s was soon cited in support of neofascist movements. It must be said that there is nothing specific about these ideas that should be useful to neofascists; merely the highly visible statement that genes affect behavior, combined with an emphasis on the strict Darwinian sense of the word *fitness*. The National Socialist youth movement in Britain adopted a sort of sociobiological cant, quoting or referring to E. O. Wilson, Richard Dawkins, and others. To be sure, they had little understanding of what they read, yet they found it useful.

An early exchange of letters published in *Nature*—correspondence between Steven Rose and Dawkins, to this day English arch-rivals in the sociobiology controversy—is still of interest (S. Rose, *Nature* 289 [1981], p. 335; R. Dawkins, *ibid.*, p. 528). Rose pointed smugly to the neofascist use of Dawkins's views, called on Dawkins to dissociate himself publicly from them, and said, almost explicitly, *I told you so*. Dawkins dissociated himself, and expressed amazement that anyone could have so misconstrued his views as to make use of them in a neofascist cause. He said explicitly that it never crossed his mind that this could happen. Now, Rose was ill-mannered, and one wonders whether he expects other scientists to conceal their findings when they turn out to be susceptible to misuse. But Dawkins's naive amazement was more distressing.

Early in the controversy, an article in *Time* magazine on sociobiology included a brief, innocuous quotation from me. I simply pointed out that not only bad human traits but also good ones such as altruism were part of our evolutionary endowment. I did not mention race or individual differences, and the rest of the article said little or nothing about either, focusing instead on universals of human nature. Yet I received a long, poignant letter from a woman who identified herself as African-American and who, despite being quite articulate, expressed thoughts and feelings that suggested mental illness. Among other things she wrote at length on the genetic and moral inferiority of African-Americans, attributing many of her own and her people's problems to this "theory." I had said nothing remotely related to the main theme of her letter, yet she had interpreted my little remark about altruism as support for her theory. She was writing in a strange spirit of collegiality and congratulation. Never since then have I underestimated the power of even a few words about behavioral biology.

What of the latest currents of thought? Are they likely to lead to, or at least encourage, further distortions of social policy? The indications are not all encouraging. Richard Herrnstein and Charles Murray published a book in 1994 clearly directed at policy, just as Jensen and others had in the 1960s and 1970s. *The Bell Curve: Intelligence and Class Structure in American Life* (New York: Free Press, 1994) teamed a psychologist with a conservative policy advocate to try to prove that both the class structure and the racial divide in the United States result from genetically determined differences in intelligence and ability. Their general assertions about genes and IQ were not very controversial, but their speculations on race were something else again.

Also in the 1990s, Phillippe Rushton has tried to couch racial differences in IQ in a theory drawn from evolutionary biology. This theory takes the concepts of *r* and *K* selec-

tion, crudely useful when applied to a vast range of living creatures considered on a continuum, and apply it to subtle differences in skull form, mental test results, and sexual behavior within our one species. This theory has no academic legitimacy and little relationship to real evolutionary theory, but it taints the whole Darwinian enterprise, strongly recalling the "scientific anthropology" of the era of slavery.

The reality is quite different. As argued by George Armelagos in his Presidential Address to the American Association of Physical Anthropologists ("Race, Reason and Rationale," *Evolutionary Anthropology* 4, 1995, pp. 103–109) race itself is a dubious concept for the human species. Obviously it is sociologically meaningful, but even in the social realm it is a constantly moving target with little or no core biological legitimacy.

The overwhelming genetic unity of our species becomes clearer all the time. We are, every one of the six billion of us, descended from a very small group of people who lived in Africa around 100,000 years ago. During almost all of that time, challenges to intelligence have been remarkably similar on every continent. There has been little or no opportunity for racial separation, and the physical variety that seems so obvious to us is just an intersection of geographic trend lines known as clines, each a gradient of variation along a particular dimension, such as nose shape, height, or skin color. You can point to any spot on earth, draw a circle around it, and call it a race, but all you will have done is arbitrarily label the local intersection of several of these clines.

The human genome project has draft-sequenced five people's genes, three women and two men, self-described as Hispanic, Asian, Caucasian, and African-American. Craig Venter, head of Celera Genomics and one of two main leaders of the project, said, "In the five Celera genomes there is no way to tell one ethnicity from another." (See chapter 17 for discussion and references.) Statistically, it has been repeatedly shown that the vast majority of human genetic variation occurs within, not between, ethnic groups (See Ryan Brown and George J. Armelagos, "Apportionment of Racial Diversity: A Review," *Evolutionary Anthropology* 10, 2001, pp. 15–20).

If this is so, why is there a persistent difference in IQ and school success among African-Americans and European-Americans? Here are a few of the reasons. Slavery was a devastating blow to African-Americans, destroying language and culture and gravely damaging family and identity. It lasted for almost three centuries, followed by another century of systematic deprivation. African slaves were virtually the only group of Americans not self-selected to come here. Twentieth-century immigrants from Africa and the Caribbean had the same racial background as the slaves but had an experience very similar to that of all other ethnic groups in U.S. history. This alone gives the lie to a genetic explanation of the problems of the descendants of former slaves.

Genetic explanations of group differences ignore the immense power of culture to govern motivation and performance. There is no culture-free test of intelligence, and mental tests have been constructed on which African-Americans outperform European-Americans. Studies have shown that even a hint of racial stereotyping in the setting of a test markedly diminishes the performance of those being stereotyped. Peer pressure is also powerful. Identifying test performance and school success as "White" has kept generations of African-Americans, especially boys, from doing well. If genes are the explanation for group differences, why do African-American girls do so much better than boys, while among European-Americans the sexes perform more similarly?

If genes are the explanation, why is there no correlation between the test performance of African-Americans and their degree of admixture of European genes? Because *sociologically* our racial designations are categorical, so that any noticeable degree of African ancestry—indeed, the label alone—exposes you to all the cultural risks associated with being Black. Why do African-American children adopted by Whites grow up performing as

well as Whites? Because they are given most of the advantages of the dominant culture. Why do the illegitimate children of Black and White American servicemen in Germany have comparable mental test scores? Because they are all brought up by German mothers, sharing most of the same cultural opportunities and disadvantages.

These are only a few of the counterarguments against ongoing, twenty-first-century racial determinism. Race is the least interesting and least significant of biological categories, yet it continues to compel the attention of many people. The most likely explanation for this is not the intrinsic merit of the subject. It is the desire to simplify the world, to justify unfair treatment of minorities, and to shore up a weak identity with a false sense of superiority. Human beings characteristically dichotomize the social world, and much of what is wrong with the world stems from this fact of human nature.

The need for vigilance continues. Anyone who investigates or writes about behavioral biology without recognizing the potential for grave misuse of it, proven many times in the last two centuries, is either a dangerous charlatan or a dangerous fool. Since the Enlightenment gave science a central place in our lives, scientific ideas have been abused. But to those who think these studies should stop, there is a clear answer: closing our eyes to biological influences cannot make them go away or prevent other people from distorting them. In fact, the distortions are made more likely by such suppression. Will there be further abuses? Of course. But can we ignore a subject so central to self-understanding? I don't think so.

Behavioral biology is a strong, dangerous physic, potentially healing if used appropriately, poisonous if not. For the great questions of race and social class, it has far more relevance to the behavior of the oppressors than it does to that of the victims. It does not show that the oppressed are inferior, but it does help explain why the oppressors are selfish, greedy, and violent. Yet other, false claims will be made for it—claims that echo the worst errors of the nineteenth and twentieth centuries. Hence, this caveat, a sort of package insert for the book, warning of the known dangers of improper use of this kind of knowledge. I would not purvey such medicine if I did not think that the human species is in a critically ill condition, needing every kind of knowledge it can get. But it would be far better for behavioral biology to disappear from view than to be applied as carelessly, as stupidly, and as destructively as it has been in the past.

A Prefatory Inquiry

- p. xiii "Unless we willfully close our eyes . . .": Charles Darwin, *The Descent of Man, and Selection in Relation to Sex* (Princeton, N.J.: Princeton University, 1871/1981).
- p. xiii "We must recollect . . .": Sigmund Freud, in *Collected papers*, Vol. 4, authorized translation under the supervision of Joan Riviere, ed. E. Jones (New York: Basic Books, 1959).
- p. xiii *Fewer than one in ten Americans accept evolution*: Gallup, Gallup Organization Poll (November 21–23, 1991).
- p. xvii *Original Tangled Wing*: Melvin J. Konner, *The Tangled Wing: Biological Constraints on the Human Spirit* (New York: Holt, Rinehart & Winston, 1982).
- p. xvii *E. O. Wilson's Sociobiology*: E. O. Wilson, *Sociobiology: The New Synthesis* (Cambridge: Harvard University, 1975).
- p. xvii *Critics in the 1980s*: Richard C. Lewontin, Steven P. Rose, and Leon J. Kamin, *Not in Our Genes. Biology, Ideology, and Human Nature*, 1st Ed. (New York: Pantheon, 1984); Philip Kitcher, *Vaulting Ambition: Sociobiology and the Quest for Human Nature* (Cambridge: MIT, 1985). I reviewed these two books in *Natural History* (August 1984) and in *The New York Times Book Review* (October 6, 1985), respectively. A recent collection, *Alas, Poor Darwin!* (see below) repeats many of

the same criticisms of sociobiology without taking account of fifteen years of further research. Stephen Jay Gould, one of the critics, is a gifted writer who for thirty years was a columnist for *Natural History*. If he had only read the rest of that magazine during those three decades, he would have realized that neodarwinian theory had become pervasive in natural history. The reason is simple: Young scientists by the thousands embraced it because it worked, and even when it didn't, it had tremendous heuristic power.

- p. xviii *Critics appear increasingly shrill*: Hilary Rose and Steven Rose, *Alas, Poor Darwin! Arguments Against Evolutionary Psychology* (New York: Harmony Books, 2001). This volume repeats tired criticisms, following the typical strategy of attacking the most extreme and vulnerable versions of sociobiological claims, with virtually no attention to the data. What is of interest in the book (for example, some pages on brain development) is largely irrelevant to the argument.
- p. xviii *Sociobiology has triumphed*: John Alcock, *The Triumph of Sociobiology* (New York: Oxford University, 2001). This is the best brief account of how late-twentieth-century research has thoroughly vindicated this paradigm. For a serious historian's account of the controversy over the past quarter century, see Ullica Sagerstråle, *Defenders of the Truth: The Battle for Science in the Sociobiology Debate and Beyond* (Oxford: Oxford University, 2000). See also Alison Jolly, "Battlefield Sociobiology: Review of 'Defenders of the Truth: The Battle for Science in the Sociobiology Debate and Beyond,'" *Science* 288 (2000), 2137.
- p. xviii *Human cloning attempts have begun*: Margaret Talbot, "The Desire to Duplicate," *The New York Times Magazine* (February 4, 2001), 40–68; Nancy Gibbs, "Baby, It's You! And You, and You . . .," *Time Magazine* (February 19, 2001), 46–57.
- p. xix *Sterilization in China*: Elisabeth Rosenthal, "Scientists Debate China's Law on Sterilizing the Carriers of Genetic Defects," *The New York Times* (August 16, 1998), 10.
- p. xx *The Life of Galileo*: B. Brecht, *Collected plays*, eds. R. Manheim and J. Willett (New York: Pantheon, 1972).

CHAPTER ONE: *The Quest for the Natural*

This chapter uses the !Kung San as one example of the hunting-gathering adaptation that is known to have played a central role in human evolution. The best current reference on hunters and gatherers generally is Richard B. Lee and Richard Daly's *The Cambridge Encyclopedia of Hunters and Gatherers* (New York: Cambridge University, 1999). From it, myriad paths lead to a large and rich literature on this vital and once-central human adaptation. Accessible introductions to the !Kung may be found in Lorna Marshall's *Nyae Nyae !Kung: Beliefs and Rites* (Cambridge: Harvard University, 1999), Richard Lee's *The Dobe Ju/'hoansi* (New York: Harcourt Brace, 1993), and Marjorie Shostak's *Nisa: The Life and Words of a !Kung Woman* (Cambridge: Harvard University, 1982). Shostak's *Return to Nisa* (Cambridge: Harvard University, 2000) offers a personal account of their situation late in the twentieth century.

Excessive emphasis on the !Kung has been rightly criticized; many other hunting-gathering adaptations have existed or still exist, some quite different from the !Kung. Studies of the Hadza of Tanzania by James Woodburn, Kristen Hawkes, and Nicholas Blurton Jones, of the Efe Pygmies of Zaire by Robert Bailey and Nadine Peacock, of the Ache of Paraguay by Kim Hill and Magdalena Hurtado, and of the Netsilik Eskimo by Asen Balikci are among the outstanding modern investigations cited below. Critics would do well to follow these examples and do research on hunter-gatherers while they are still around to be studied. In addition to the *Cambridge Encyclopedia*, good sources on a range of hunter-gatherer societies include *Hunters and Gatherers: History, Evolution, and Social Change*,