

Race

Past, Present, and Future

JONATHAN MARKS

The relationships among anthropology, genetics, and race are far more complex than commonly presented. In this chapter I will explore the development of the race concept as a scientific theory in the 18th and 19th centuries and the insights provided over the course of the 20th century by genetics and anthropology. This chapter will show how race as an idea has evolved over the last century, so that even people who swear to its existence would not agree on its nature; how race involves a constant negotiation between difference (a biological state) and otherness (a cultural state), creating groups of people whose biological diversity is commonly at odds with their sense of unity; and, finally, how the complexities of the usage of race belie the possibility of it beneficially augmenting medical practice.

Origins of the Race Concept

The concept of race arose at the conjunction of two historical moments: the Scientific Revolution (privileging the study of nature and particularly its classification) and the Age of Colonialism (establishing hegemonic economic relations with unfamiliar, and commonly fluid, political and social entities).

Everyone everywhere (including pre-modern Europeans) has always identified themselves as distinct from and commonly in opposition to their neighbors. But the distinctions are rarely considered natural, immutable, or global—the core features of the race concept. Thus, although Josiah Nott and George Gliddon (before the Civil War) invoked a tomb painting from 18th Dynasty Egypt as putative evidence that the ancient Egyptians depicted and conceptualized race roughly as we do today, this is a misrepresentation. The

painting simply shows that they noticed physical differences in relation to the people north of them and south of them—in other words, they weren't blind (see Isaac, 2004).

Race as we understand it today is a result of the encounter of early modern Europeans with exotic peoples and the new esteem accorded to naturalistic, scientific explanations of the meaning of the diversity represented by those peoples in relation to their "discoverers." Consequently, it is difficult to identify real intellectual antecedents for the works of François Bernier in 1684 and Carl Linnaeus in 1735 (see Stuurman, 2000). Comte de Buffon introduced the word "race" into the study of human diversity in 1749, but he used it in a casual and non-technical sense, meaning a "local strain." By the turn of the 19th century Buffon's term ("race") had become wedded to Linnaeus's concept ("subspecies"), and the modern scientific idea of race emerged—a fundamental taxonomic division of the human species. Racial classifications of the 19th century are noteworthy principally for their inconsistency and instability—one scholar emphasizing complexion; another, hair form; another, skull shape; and still another, geography. While there might be crude agreement in, for example, separating the peoples of Northern Europe, West Africa, and Southeast Asia from one another, most of the rest of the peoples of the world seemed to be in some degree of perpetual disarray.

Race in the 20th Century

The fruits of racial classification were descriptions of types, like Platonic essences. Linnaeus described *Homo sapiens Europeanus albus* in 1758 as having blue eyes and long, flowing blond hair ("Pilis flavescentibus prolixis[.] Oculis caeruleis"), while knowing full well that the vast majority of Europeans possessed neither of those features. His purpose was not empirical, but ideal: he was describing what *Homo sapiens Europeanus albus* was supposed to look like.

Such a concept was difficult to assimilate to Darwinian biology, and Mendelian genetics made race-as-essence even more untenable. Mendelian inheritance is quantitative and probabilistic; an individual has a one-eighth chance of inheriting a particular gene from any great-grandparent, and that holds across all genes and across all great-grandparents. At the same time that "one drop of blood" sufficed to make a person non-white, it was becoming unclear just what could be transmitted genetically in such a fashion. "Passing," the scourge of racial classifiers, was a simple lie under essentialist logic, but an ambiguous fact of complex ancestry under Mendelian logic.

By the early 20th century, racial essences were being supplanted by races that were conceptualized quite differently, as geographical subdivisions. William Z. Ripley (1899) formalized the peoples of Europe not so much

into types as into regions: Nordic, Alpine, and Mediterranean. That each of these divisions might also embody an average physical appearance created much confusion between race-as-essence and race-as-geographical-type.

In the first, however, a race was embodied in a person; while in the second, a person was a member of a race. The very locus of race had been altered, and its relation to the individual organism had been reversed. A series of book-length works proceeded to explain what race "really" was, stretching from Huxley and Haddon's *We Europeans* (1936) through Ashley Montagu's *Man's Most Dangerous Myth* (1942) and William C. Boyd's *Genetics and the Races of Man* (1950). Of considerable influence in this regard was Theodosius Dobzhansky's magisterial synthesis, *Genetics and the Origin of Species* (1937), which used "race" zoologically, in a strictly geographical sense.

No longer abstract forms, human races were now groups of real people, that is to say, populations. They were the explicit focus of the 1950 Cold Spring Harbor Symposium, organized by Dobzhansky and physical anthropologist Sherwood Washburn. At the end of the symposium, Harvard's race expert, Earnest Hooton, signed to the co-organizer, his former student, "Sherry, I hope I never hear the word 'population' again!"

The political environment of the 1930s had engendered a crisis in racial studies, which culminated in a paradigm shift (in Kuhn's original [1962] sense, with key terms being used incommensurably). The shift from a Platonic to a geographical concept of race, or from an essentialist to a populational concept, reflected a change in ideas about what race is, but not a negation of it (e.g., Krogman, 1943). Cultural anthropologists, while downplaying the possibility of racial endowment as a significant cause of behavior or history, accepted the existence of such taxonomic divisions as a scientific fact. That our species could be divided taxonomically was separated from questions of behavior and civilization by the progressive students of Franz Boas, the founder of modern American academic anthropology. Alfred Kroeber's 1923 textbook, *Anthropology*, for example, divided the peoples of the world into three branches and sixteen sub-branches. Ruth Benedict and Gene Weltfish's *The Races of Man*, a pamphlet commissioned by the USO in 1943 for distribution to soldiers, and later declared subversive for its egalitarian message, nevertheless proceeded from the assumption that there indeed exists a small number of different kinds of people. Likewise, Ashley Montagu's 1950 "UNESCO Statement on Race" specified three "divisions" of *Homo sapiens*, corresponding to European, Asian, and African, with an unspecified number of subdivisions.

Perhaps the last major exposition of this kind of taxonomic activity was William Boyd's genetic synthesis, published in *Science* in 1963, identifying 13 races, clustered into 6 larger groups (5 of the 13 hailing from Europe, but only 1 each from Africa and Asia—testifying eloquently to the cultural aspects of

the endeavor). Meanwhile, the political environment of the early 1960s—the civil rights era—created a second crisis in racial studies and engendered a second paradigm shift. With the sitting president of the American Association of Physical Anthropologists (Carleton S. Coon) giving clandestine assistance to the segregationists, Sherry Washburn (1963) proclaimed the study of race to be an obsolete research program. Frank Livingstone wrote, “There are no races, there are only clines” (1962, p. 279)—invoking a term coined by Julian Huxley in 1938 to describe geographical gradients of features in natural populations, which seemed to be a better description of human diversity (see Serre and Pääbo, 2004). Local populations could be taken as the closest thing to natural units of the human species, but higher-order clusters were now recognized as arbitrary and ephemeral (Thieme, 1952; Hulse, 1962; Johnston, 1966). The British physical anthropologist J. S. Weiner described the human species “as constituting a widespread network of more-or-less interrelated, ecologically adapted and functional entities” (1957, p. 75).

In 1972, geneticist Richard Lewontin gave a quantitative basis for dismantling the race-as-population, calculating that there was about sixfold more within-group variation than between-group variation detectable in the human gene pool. This implied that the idea of races as discrete, geographically localized groups was unsustainable. Eric Wolf’s *Europe and the People without History* (1982) refocused attention on the exchange and contact (economic and genetic) that has always existed among human populations.

By the early 1980s, physical anthropology had withdrawn from the study of race, which had defined the field’s scope for much of the century. The principal aspect by which humans differed from one another was cultural; what was not cultural was principally polymorphic; what was not polymorphic was principally clinal; what was not clinal was principally local; and what was left of human diversity—that which was not cultural, polymorphic, clinal, or local—was not much. Race was therefore abandoned to the cultural anthropologists on one side (as a major set of social facts), and to the geneticists on the other (as a minor set of natural facts).

This left a small window remaining open, however, for yet another shift in the conceptualization of race. If biological variation could be seen as a Venn diagram, with 85% overlap and a small amount of unique diversity in each circle, then one could direct one’s focus very closely to the small amount of localized variation, essentially contrasting the most extreme members of any circle.¹

This approach focuses on the extremes, however, at the expense of the majorities. It fails to tell you how many natural groups there are (which is decided a priori, as Bolnick details in this volume), fails to classify properly most of the world’s living peoples (who do not hail from the geographic extremes), and fails as well to classify diachronic populations. An

archaeological population from East Africa can be allocated heuristically to the corners of the globe in this fashion (Williams, Belcher, and Armelagos, 2005), and a 9,500-year-old skeleton from Kennewick (in America) is infamously allocated first to France, and then re-assigned to Polynesia (Chatters, 2001; Powell, 2005).

The word remains the same (yes, “race”), but the concept underlying it has again been radically reformulated. It is now a very careful look at the most divergent qualities of the most geographically separated peoples, so as to maximize detectable differences between groups. This is exemplified by the study of Ancestry Informative Markers, or AIMs—an analysis of the residuals of human genetic variation once the major features of that variation are dismissed. Here, an individual’s African ancestry is inferred from genetic similarity along a few dozen genetic markers (sampled across 25,000 genes and 3 billion DNA bases in a human genome), derived from a few dozen cell lines from Central-West Africa, carefully chosen to be maximally different from a comparable sample of East Asians and Northern Europeans. While this is not “race” in any previously familiar sense of the term, it is readily conflated with such notions, whether ingenuously or not.

To enter into a discussion of whether race is “real” today, then, is to miss the fact that race has itself evolved over the last century, from a qualitative judgment of “what you really are” to “where you really come from,” and finally to a crude quantitative assessment of your similarity to the gene pools of the most divergent peoples.

Race as a Theory of Kinship

Anthropologists know that we “make sense” of human diversity; its sense or meaning does not come ready-made for us. In Claude Lévi-Strauss’s famous phrase, race can be best understood as a scheme of classification that is “good to think with,” in that it imposes an order upon nature, which helps to confront, understand, and manipulate it. That is true of many things that are not tangible, but which help us make sense of the world and stimulate social action (Lévi-Strauss, 1962).

Race—in any guise—is a theory of kinship. It tells you who you are and what you are. Kinship is a system of classification, in which complex relationships of biology (procreation) and law (marriage) are organized into a coherent framework (Bohannon 1963; Fox 1969; Carsten 2003; Franklin and McKinnon, 2002). This framework provides the basic social orientation for an individual: it defines who is a member of your family and who is not. As new forms of marriage and new forms of procreation appear, they are perceived as threatening and potentially disorienting because they challenge this social order.

While procreation is biological, descent is not. Descent depends on the assignment of a status based on the facts of birth. This is why "bastardy," for example, is a cross-cultural insult. "No primate other than man can remember his ancestors up to the thirteenth and fourteenth generations, nor can he conceptualize 'second cousin once removed,' even though he *has*, biologically, such a relative. And certainly he could not attach legal, political or economic significance to such a relationship" (Fox, 1969, p. 30). The facts of nature are quickly overtaken by the facts of culture. Kinship systems are codes of meaningful similarity: Your mother's sister and your father's brother's wife may be equivalent relations to you ("aunts"), or they may not be, given that the former is a blood relative and the latter is not. Since marriage is a political status and coexists as an economic, social, sexual, reproductive, and residential unit, it can take many diverse forms—each of which has a direct impact upon one's ideas of what the family is. The boundaries of the family are consequently symbolic and powerful: a first cousin may be a preferred spouse in one setting (like Charles Darwin's) or an incestuous mating in another (like Jerry Springer's).

Kinship, then, is a symbolic system of classification that adopts some aspects of natural relationships and suffuses them with arbitrary cultural distinctions. In this way, one's identity is established and the appropriate expectations for particular social interactions can be formalized and learned. One knows on whom one can count, who can be approached by virtue of sharing a common bond (that of ancestry), and who is alien. The distinction between "ingroup" and "outgroup" is understood as hierarchically inclusive and oppositional: two rival groups may readily unite against a common outsider (Leach, 1968).

Most significantly, however, kinship uses metaphors of nature to express social norms—blood is thicker than water, incest is a crime against nature, blood will tell, and the like—and thus commonly misrepresents itself as a natural system by obscuring or concealing its historical or constructed aspects (Schneider, 1968).

This is the intellectual context in which to understand race. Race is simply one aspect of the complex system of identity formation. Identity is itself a negotiation among statuses rooted in genetics (dwarf? diabetic?), other aspects of biology and behavior (teenager? transgender?), sociopolitical categories (Catholic? Cuban? doctor?), and what slots are even available to be occupied (witch? Hispanic? mulatto? Brooklyn Dodgers fan?). These run a gamut from mostly naturally constituted to mostly historically constituted, but what they share is that they orient you in a social universe, give meaning to life, and regulate behavior and social interactions by indicating just who and what you are and to whom you may be fundamentally akin.

Corporate Genetics

It is thus not surprising that kinship would emerge as a potentially lucrative market for genetics companies. Certainly, the most noteworthy aspect of the life sciences over the last generation has been the transformation of genetics. The development of technologies from 1960 to 1985—gel electrophoresis, the isolation and production of restriction enzymes, DNA sequencing, and the Polymerase Chain Reaction—made it possible to conceive of a Human Genome Project. But the project could not be justified solely as a chance to apply these technologies on a large scale. To secure the billions in federal funding it would take, the Human Genome Project had to convince the public of its value. In large part, the Human Genome Project was justified by recourse to familiar hereditarian social philosophies. Said James Watson famously in *Time* magazine, "We used to think our fate was in the stars. Now we know, in large measure, our fate is in our genes" (Nelkin and Lindee, 1995). Finally, through the investment of capital, biotech start-up companies began to transform the Human Genome Project into profit ventures. This is not necessarily bad, but it is not the science that we grew up with, nor that our professors taught us. This is not the science of Theodosius Dobzhansky or of James Neel—which was by no means "pure," but whatever it was, it was science. And the nonscientific issues it grappled with were relatively simple: notably, ideological prejudice. That, of course, is still with us, but now there is a profit motive: there are products to sell and a market to create and maintain.

Capital has transformed genetic science, but into what? There is not even a word for a science in which the production of capital is so intimately associated with the production of knowledge, in close synergy with the creation of a market for that knowledge. You can't call it pseudo-science because the people doing it have impeccable scientific credentials.² Whatever modern human genetics has become, it is not the science of a generation ago, and it now uses technology, professional expertise, and the authority of the scientific voice in support of goals that are not classically or normatively scientific.

An unprecedented amount of it is taking place outside of academic contexts, producing unprecedented questions of conflicting loyalties, interests, and motivations. And it need hardly be pointed out that it is in the interests of this transformed science to overvalue the significance of genetics in life. The more of life you think genetics controls, the larger the potential market for its products. But how can you possibly then know what to believe amid the conflicted interests, intellectual prejudices, and cultural naïveté of the practitioners?

In 1937, Earnest Hooton struggled (largely unsuccessfully) to differentiate his own racial science from that of his German colleagues. "There is," Hooton wrote, "a rapidly growing aspect of physical anthropology which is nothing less than a malignancy. Unless it is excised, it will destroy the science. I refer to the perversion of racial studies and of the investigation of human heredity to political uses and to class advantage. . . . [T]he output of physical anthropology may become so suspect that it is impossible to accept the results of research without looking behind them for a political motive" (1937, pp. 217–218). To the extent that genetics now leads the way in the study of human variation, the same class values, naïveté, and enlightened self-interest remain—witness the reluctance of the American Society of Human Genetics to repudiate the folk ideas about heredity popularized by R. Herrnstein and C. Murray's *The Bell Curve* in 1994 (Andrews & Nelkin, 1996) and the confusion over the analysis of the human gene pool with the computer program *structure* and its relation to the ontology of race (Rosenberg et al., 2002; Wade, 2002; Feldman & Lewontin, this volume; Bolnick, this volume). But the financial conflicts introduced in the last generation by privatized interests make it even more difficult to gauge the truth value of any claims in human genetics, as evidenced by the public discussion of race precipitated by HBDJ (Kahn, this volume) and the boom in scientific genealogy that tends to gloss over the fine print (Greely, this volume).

This confusion has proved to be easily exploited. There are several areas of contemporary racial/genetic science where Hooton's worst fears, it would seem, have come true.

Racial Taxonomism

The first claim centers on the racial taxonomists, those who rely race and claim that human beings do, indeed, fall into a small number of largely discrete natural categories. Spurning the last half century of research into patterns of human variation, the argument here is that left-wing cultural prejudice has suppressed an obvious fact of biology (Enline, 2000; Sarnich & Miele, 2004; Leroi, 2005).³ The precise composition of these ostensibly natural categories, or what they represent, is rarely made explicit; and where it is, the assertion is easily refutable.

Philosopher Robin Andreason (2000, 2004) has recently attempted to resuscitate the race concept formally, by reference to what she calls a "cladistic" race. Cladistics is a philosophy of biological classification that privileges recent common ancestries in the establishment of taxonomic categories (Eldredge & Cracraft, 1980). Race here is a node of the tree of population bifurcations, popularized in the work of Cavalli-Sforza, Menozzi, and Piazza (1995). Actually, however, the tree itself is a statistical reification and not

at all a series of historical events, upon which cladistics relies (Templeton, 1998). These trees are phenetic (based on similarity) rather than cladistic (based on monophyletic descent, that is, from a series of unique ancestors) and incorporate many kinds of groups (Moore, 1994), often subsuming recently re-merged lines of ancestry of varying degrees (see fig. 1-1).

Real human populations are connected genetically, and the labels that Andreason takes as racial generally do not satisfy the cladistic stricture of monophyly (that is, unique single ancestry). What is most confusing here is that race and cladistics are both about classification. If "cladistic races" are real, then they imply a system of classifying people into natural monophyletic groups; but such groups do not exist and are simply being inferred from a specious interpretation of the genetic literature. If a cladistic race concept contains such internal contradictions, and must mythologize human history in order to be applicable, it is difficult to see much anthropological value in it.

The study of human diversity would be better served by the recognition that human populations are in reality variably sized bio-cultural units. Each has its own genetic idiosyncrasies, the result of adaptation to local circumstances and to the historical accidents of survival and proliferation. Each has the properties of being (1) historically ephemeral (as Hittite or Anasazi); (2) hierarchically organized (as in the nested categories Caucasoïd, Nordic, Slavic, Baltic, and Latvian); (3) genetically porous (in manners that run a gamut from exogamy and adoption to kidnap and mass rape); and (4) culturally bounded (as a species with little genetic variation relative to apes and

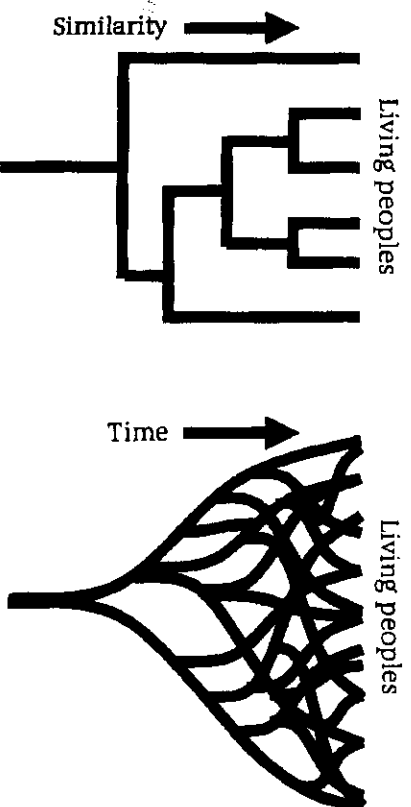


FIGURE 1-1. *Left*, a bifurcating tree, the product of applying clustering methods to genetic data derived from discretely defined populations, to estimate the patterns of similarity among gene pools. *Right*, a reticulating tree, depicting the complex biological histories of human populations.

with a concomitant tendency to identify our group by adornment, speech, movement, and custom, whether or not biological distinctions exist).

This is what human variation is about. Race—that is to say, the existence of a fairly small number of naturally distinct or different kinds or types of people—is not.

Population Genetics

The second area in which conflicts of interest of one sort or another have led to confusion, and to an erosion of confidence in its claims, is population genetics. At the same time that Lewontin was undermining the existence of geographical race, other population geneticists were using it unproblematically as an analytic category. As late as the 1990s, population geneticists were coming forward with claims such as "ancestral Europeans are estimated to be an admixture of 65% ancestral Chinese and 35% ancestral Africans" (Bowcock et al., 1991, p. 840), duly publicized as "All Europeans are thought to be a hybrid population, with 65% Asian and 35% African genes" (Subramanian, 1995).

This ambiguity recapitulates earlier states of affairs in the genetic analysis of human diversity. Utilizing the earliest genetic data on ABO blood groups, Laurence Snyder proceeded to identify basic races; but since the ABO allele frequencies only vary within a fairly narrow range, it is not uncommon for distantly related peoples to have similar ABO frequencies. Thus Snyder (1926) was obliged to associate (spuriously) the peoples of Poland and China, for example. In other words, the available genetic data were largely useless for studying race, as Hooton (1931, p. 490) dismissively noted. The argument was not about what the basic patterns of human variation are, but rather, how genetic data reveal the basic patterns more clearly than other classes of data. The self-serving assumption that genetic data superseded all others in this area prompted a heated exchange at the Royal Anthropological Society in 1932 (discussed in its journal, *Man*) and similar arguments in the journal *Science* in the 1940s and the *American Journal of Physical Anthropology* in the early 1950s (Marks, 1996).

In retrospect we can see that, ironically, the genetic data did have it right—human variation, indeed, just does not sort out racially—but since race was understood to be the organizing principle of human variation at the time, it was crudely assumed that the genetic data had to show it and would necessarily reveal it more compellingly than other classes of data. In other words, the geneticists were finding what they were looking for and were finding it with an astounding lack of introspection or intellectual breadth.

The sad case of the recent Human Genome Diversity Project reveals the ambiguities of contemporary human population genetics. The project failed

to grapple adequately with the issues that large-scale collection of indigenous people's cells might incur: the patenting of cell lines, the manipulation of rights and identities, the meaning of voluntary informed consent in a cross-cultural context, the social and political legacy of colonialism, ownership of the body, and personhood, much less the widespread fear of witchcraft by blood theft and the possible development of weapons of mass genetic destruction. The best the Diversity Project could do was to avow that at least they weren't racists and that they didn't care about making money from the venture. Rather than resolve the problems, however, human population geneticists instead turned to private sources of funding, and now the Genographic Project makes much the same claims about their good intentions, with even less attention given to the actual issues that undid the Diversity Project (Small, 2006; Harmon, 2006).

Today, with massive federal funding failing to materialize for the Human Genome Diversity Project (Reardon, 2004), pharmaceutical money may be poised to take its place. The niche marketing of BiDiI as a race-specific drug (Kahn, 2004) violates the patterns of human genetic diversity as surely as a perpetual-motion machine violates the laws of physics. Nevertheless, it represents the foot in the door and can readily be complemented and rationalized through the reification of race. Not surprisingly, there is considerable overlap between the scholars advocating racial taxonomism and those touting BiDiI and racialized medicine (Sattel, 2002; Leroi, 2005).

Behavioral Genetics

In behavioral genetics we find perhaps the greatest amount of confusion. The broad convergence of interest between innatist theories of human behavior and conservative social politics has been acknowledged for close to a century (Davenport, 1911; Darrow, 1926; Lewontin, Rose, & Kamin, 1984). This was the crux of the controversy over *The Bell Curve*, co-authored by a political scientist (Herrnstein & Murray, 1995).

In principle, behavioral genetics should not be politically threatening since the basic patterns it seeks to study are well known. Human genetic variation is, in the main, clinal and polymorphic; human behavioral variation is, in the main, discrete and polytypic and is the product of historically and socially produced differences. That is to say, in the grand scope of what human beings think and do, the major differences are cultural. Some people may be genetically happier or more impulsive or better spellers, but such people dress the same, speak the same language, eat the same kinds of foods, and pray to the same gods as the people with different alleles.

In other words, to the extent that people differ in temperament or brainpower, and that such differences may be genetic in origin, those

differences can only explain at best why two people in the same population do slightly different things. For example, there might well be an imaginary brain hormone receptor with an allele that makes you a little happier. We should expect its distribution, however, to be similar to other genetic variation: that is, clinal and polymorphic.

This has an important correlate, however. The same brain hormone receptor allele in a Harvard professor and a Yanomamo would not make their lives any more similar. They might get through the day a little more happily than other Harvard faculty members and other Yanomamo, but no significant aspect of their lives would thereby converge—for what makes their lives so different lies not in their brain genes, but in their social histories and circumstances. Thus, to the extent that there exists the possibility of studying the effects of genetic variation upon human behavior, that opportunity exists for studying only those features of human behavior that vary as genetic differences tend to—within populations. That is to say, only the most minor features of the diversity of human thoughts and behaviors.

The interests of the behavioral geneticist and the racist differ, but they converge if the discordant patterns of human behavioral and genetic variation are ignored. Then, genetic variation in behavior, which may be useful in explaining within-group differences, can casually be extrapolated to explain between-group differences in mind and deed. Such an extrapolation is entirely illegitimate, yet every generation seems to be confronted with it (Lewontin, 1970; Marks, 2005). Thus, the arguments of Herrnstein and Murray (1995) are identical in structure to those of Arthur Jensen (1969)—including especially the misapplication of "heritability" (a within-group calculation misapplied to explain between-group differences).

Interestingly, some of the strands are connected through the philanthropic activities of a wealthy textile magnate named Wycliffe Draper. Draper sponsored projects ranging from the deleterious effects of race-crossing in the 1920s, through the demonstration of IQ differences between whites and blacks, and up to activism against school integration in the early 1960s. The focus of his philanthropy gradually expanded to include research committed to demonstrating innate variation in behavior and personality, accompanied by the seductive (if invalid) extrapolation from the causes of within-group variation to the causes of between-group variation. Draper's money also subsidized the publication of the *Mankind Quarterly*, an ostensibly scholarly journal that scandalized the scientific community with its racist orientation in the early 1960s, and went on to fund Arthur Jensen and William Shockley generously in the 1960s and 1970s.

In the 1980s, Draper's Pioneer Fund sponsored the research of the psychologist Thomas Bouchard on identical twins separated at birth. These well-publicized studies, invoking the genetic basis of intelligence and

personality, are usually intertwined with stories about the psychic abilities of these twins, apparently on equally firm scientific footing. And in the 1990s, it sponsored the racial research of J. Philippe Rushton, currently the Pioneer Fund's president.

The Pioneer Fund did not subsidize *The Bell Curve*, but *The Bell Curve* cited many of the researchers it had sponsored as well as several articles published in the *Mankind Quarterly*. Philippe Rushton's bizarre ideas—that Africans evolved to be dumb and promiscuous; Asians, to be smart and under-sexed; and Europeans, to be the happy medium—are also cited in *The Bell Curve*, along with a pre-emptive appendix defending them.

Even work in human behavioral genetics that is not so overtly political usually turns out to be unreliable, a path to headlines and best-sellers with little scientific merit—such as the genes for male homosexuality, novelty seeking, and religiosity (Hamer, Hu, Magnuson, Hu, & Pallatucci, 1993; Hamer & Copeland, 1998). What research can actually be believed in this area is frankly anybody's guess, and its connections to race are even more tenuous, but those inferences are readily drawn. As Hamer and Copeland nonchalantly explain, "There is still such great variation in the [novelty-seeking] gene in modern day humans. . . . [D]ifferent ethnic and racial groups, who evolved under different environmental circumstances, have noticeably different frequencies of the different variations" (1998, p. 49).

Health Care, Race, and Genetics

Anthropology has productively studied human diversity for decades without the underlying belief that a small number of natural divisions of the species exists, and it certainly will continue to do so. It stands to reason that health care would benefit more from the scientific knowledge of how human variation is patterned than from racial mythology.

Let us consider some neoracial research strategies. First, we can contrast groups as social units. The health differences between blacks and whites can be contrasted as readily, without relying them, as one might contrast the health of a sample of sailors and coal miners. Second, we can contrast groups as phenotypic units: darkly versus lightly complected, tall versus short, blond versus brunet, fat versus thin. Third, we can study geographical or ecological units: high-altitude dwellers in the Andes, circumpolar peoples, rainforest peoples, industrialized peoples in temperate climates. And fourth, we can contrast human populations in terms of their local histories, adapted to their conditions or disproportionately expressing the genetic legacy of an ancient founder by "accident."

It is critical to distinguish also between risk assessment and diagnosis (on the one hand), and intervention (on the other). Knowing the identity or

identities of a patient can be of obvious value, as the health risks associated with being a prostitute, Ashkenazi Jew, Pima Indian, or computer programmer may be quite specific (for example, gonorrhea, Gaucher's disease, diabetes, or carpal tunnel syndrome, respectively). Nevertheless, it seems hard to imagine that the same health problem would necessitate distinct kinds of treatment in different groups (unless the difference involved adapting the intervention to particular sociocultural norms).

Even the principal and most familiar genetic risks do not sort themselves out "racially" in any ordinary meaning of that term. Human populations have their own particular genetic risks, the result of their biosocial histories. Sickle-cell anemia, so familiar for its prevalence in Equatorial Africans, is rare in Southern Africans and more common in Saudi Arabians. Tay-Sachs disease is more common in Ashkenazi Jews, but what have they to do with race? Porphyria variegata is common among South African whites of Dutch ancestry (by virtue of founder effect) and also among Coloureds (by virtue of gene flow). Ellis-van Creveld Syndrome is famous for its incidence among the Pennsylvania Amish, but again, what have they to do with race? Alpha-thalassemia is found commonly among East Asians and Melanesians, apparently adaptive à la sickle-cell. Cystic fibrosis is most prevalent in Northern Europeans, and lactose intolerance is common in everybody else. The appropriate model here is not a racial one, but a biosocial one.

Health care can benefit by knowing something of the self-identification of the subject, given that different groups have different risks, due to their histories or life circumstances. But race is not the cause of it; in fact, race will positively obscure it. So of what benefit would racialized medicine possibly be? A therapeutic intervention would have to be based on the genotype, not on any racialized identity. And if there is anything that is secure as positive knowledge in the study of human variation over the last few decades, it is that race is a very poor surrogate for genotype.

Conclusion

Perhaps the most extraordinary aspect of the revival of race in biomedicine is its explicit rejection of decades of professional scholarship on the subject of human variation and the acceptance instead of common, or folk, knowledge. It has an interesting parallel elsewhere on the ideological spectrum. Anthropologists have grown accustomed to hearing that they are pawns in a conspiracy to deceive the public and to indoctrinate them into the counter-intuitive dogma of evolution. That the creationists and the race reiners would find a common enemy in the anthropologists, and adopt parallel rhetoric against them, is a great irony. The race reiners, after all, generally

claim to be speaking in Darwin's name, just as the creationists claim to be speaking in Jesus' name, against their enemies, the anthropologists.

There seems to be little else binding the creationists and the scientific racists together, aside from their common hostility toward the accumulated scientific knowledge of anthropology. This bond of anti-intellectualism would be unremarkable in American society (Holsstadter, 1963) were it not for one crucial difference between the anthropology-bashing scientific racists and the anthropology-bashing creationists: namely, that racialized biomedicine puts actual lives at risk by ignoring natural patterns of variation and mistaking the confabulations of social history for authoritative knowledge about the world, while creationism only threatens minds.

NOTES

1. This is in fact what forensic anthropologists had been practicing, although with very little reflection. If you know that the extremes of human groups can be crudely distinguished on the basis of metrics describing nasal breadth, facial conformation, cranial shape, and femoral curvature, it is not difficult to apply those measurements to make a better-than-random guess about the origin of an unknown skeleton.
2. You could call it "schmience," I suppose.
3. This charge, denying the actual empirical patterns of human variation and claiming that scholarly determinations about race had been ideologically hijacked by left-wing anthropologists, was leveled initially by segregationists a half-century ago (Putnam, 1961).

REFERENCES

- Andreasen, R. O. (2000). Race: Biological reality or social construct? *Philosophy of Science*, 76, 653-666.
- Andreasen, R. O. (2004). The cladistic race concept: A defense. *Biology and Philosophy*, 19, 425-442.
- Andrews, L. B., & Nelkin, D. (1996). The Bell Curve: A statement. *Science*, 271, 13-14.
- Bohannon, P. (1963). *Social anthropology*. New York: Holt, Rinehart.
- Boinick, D. A. (2008 [this volume]). Individual ancestry inference and the reification of race as a biological phenomenon. In B. A. Koenig, S. S.-J. Lee, & S. S. Richardson (Eds.), *Revisiting race in a genomic age* (pp. 70-85). New Brunswick, NJ: Rutgers University Press.
- Bowcock, A. M., Kidd, J. R., Mountain, J. L., Hebert, J. M., Carotenuto, L., Kidd, K. K., & Cavalli-Sforza, L. L. (1991). Drift, admixture, and selection in human evolution: A study with DNA polymorphisms. *Proceedings of the National Academy of Sciences*, USA, 88, 839-843.
- Boyd, W. C. (1950). *Genetics and the races of man*. Boston: Little, Brown.
- Boyd, W. C. (1963). Genetics and the human race. *Science*, 140, 1057-1065.
- Carten, J. (2003). *After kinship*. London: Cambridge.
- Cavalli-Sforza, L. L., Menozzi, P., & Piazza, A. (1995). *The history and geography of human genes*. Princeton, NJ: Princeton University Press.

- Charters, J. C. (2001). *Ancient encounters: Kennewick man and the first Americans*. New York: Simon and Schuster.
- Darrow, C. (1926). The eugenics cult. *American Mercury*, 8, 129-137.
- Davenport, C. (1911). *Heredity in relation to eugenics*. New York: Henry Holt.
- Dobzhansky, T. (1937). *Genetics and the origin of species*. New York: Columbia University Press.
- Eldredge, N., & Cracraft, J. (1980). *Phylogenetic patterns and the evolutionary process: Method and theory in comparative biology*. New York: Columbia University Press.
- Entine, J. (2000). *Taboo: Why black athletes dominate sports and why we're afraid to talk about it*. Washington, DC: Public Affairs Press.
- Feldman, M. W., & Lewontin, R. C. (2008 [this volume]). Race, ancestry, and medicine. In B. A. Koenig, S. S.-J. Lee, & S. S. Richardson (Eds.), *Revisiting race in a genomic age* (pp. 89-101). New Brunswick, NJ: Rutgers University Press.
- Fox, R. (1969). *Kinship and marriage*. London: Pelican.
- Franklin, S., & McKinnon, S., eds. (2002). *Relative values: Reconfiguring kinship studies*. Chapel Hill, NC: Duke University Press.
- Greely, H. T. (2008 [this volume]). Genetic genealogy: Genetics meets the marketplace. In B. A. Koenig, S. S.-J. Lee, & S. S. Richardson (Eds.), *Revisiting race in a genomic age* (pp. 215-234). New Brunswick, NJ: Rutgers University Press.
- Hamer, D., & Copeland, P. (1998). *Living with our genes: Why they matter more than you think*. New York: Doubleday.
- Hamer, D., Hu, S., Magnuson, V. L., Hu, N., & Pattauci, A. M. L. (1993). A linkage between DNA markers on the X chromosome and male sexual orientation. *Science*, 261, 321-327.
- Harmon, A. (2006, December 10). DNA gatherers hit a snag: The tribes don't trust them. *New York Times*, p. 1.
- Herrstein, R., & Murray, C. (1995). *The Bell Curve*. New York: Free Press.
- Holstadter, R. (1963). *Anti-intellectualism in American life*. New York: Alfred M. Knopf.
- Hooton, E. A. (1931). *Up from the ape*. New York: Macmillan.
- Hooton, E. A. (1937). *Apes, men, and morons*. New York: Macmillan.
- Hulse, F. S. (1962). Race as an evolutionary episode. *American Anthropologist*, 64, 929-945.
- Huxley, J. S. (1938). Cline: An auxiliary taxonomic principle. *Nature*, 142, 219-220.
- Huxley, J., & Haddon, A. C. (1936). *We Europeans*. New York: Harper and Brothers.
- Isaac, B. (2004). *The invention of racism in classical antiquity*. Princeton, NJ: Princeton University Press.
- Jackson, J. (2005). *Science for segregation*. New York: New York University Press.
- Jensen, A. (1969). How much can we boost IQ and scholastic achievement? *Harvard Educational Review*, 39, 1-123.
- Johnston, F. E. (1966). The population approach to human variation. *Annals of the New York Academy of Sciences*, 134, 507-515.
- Kahn, J. (2004). How a drug becomes "ethnic": Law, commerce, and the production of racial categories in medicine. *Yale Journal of Health Policy, Law, and Politics*, 4, 1-46.
- Kahn, J. (2008 [this volume]). Patenting race in a genomic age. In B. A. Koenig, S. S.-J. Lee, & S. S. Richardson (Eds.), *Revisiting race in a genomic age* (pp. 129-148). New Brunswick, NJ: Rutgers University Press.
- Kroeber A. L. (1923). *Anthropology*. New York: Harcourt, Brace.

- Krogman, W. M. (1943). What we do not know about race. *Scientific Monthly*, 57, 97-104.
- Kuhn, T. (1962). *The structure of scientific revolutions*. Chicago: University of Chicago Press.
- Leach, E. R. (1968, October 10). Ignoble savages. *New York Review of Books*, 11 (6) (<http://www.nybooks.com/articles/11540/>).
- Leroi, A. F. (2005, 14 March). A family tree in every gene. *New York Times*.
- Levi-Strauss, C. (1962). *La pensée sauvage*. Paris: Librairie Plon.
- Lewontin, R. C. (1970). Race and intelligence. *Bulletin of the Atomic Scientists*, 26, 2-8.
- Lewontin, R. C. (1972). The apportionment of human diversity. *Evolutionary Biology*, 6, 381-398.
- Lewontin, R. C., Rose, S., & Kamin, L. J. (1984). *Not in our genes*. New York: Pantheon.
- Livingstone, F. B. (1962). On the non-existence of human races. *Current Anthropology*, 3, 279-281.
- Marks, J. (1986). The legacy of serological studies in American physical anthropology. *History and Philosophy of the Life Sciences*, 18, 345-362.
- Marks, J. (2005). Anthropology and the Bell Curve. In C. Besteman and H. Gusterson (Eds.), *Why America's top pundits are wrong: Anthropologists talk back* (pp. 206-227). Berkeley: University of California Press.
- Montagu, A. (1942). *Man's most dangerous myth: The fallacy of race*. New York: Columbia University Press.
- Moore, J. H. (1994). Putting anthropology back together again: The ethno-genetic critique of cladistic theory. *American Anthropologist*, 96, 925-948.
- Nei, M., & Roychoudhury, A. (1974). Genic variation within and between the three major races of man, Caucasoids, Negroids, and Mongoloids. *American Journal of Human Genetics*, 26, 421-443.
- Nelkin, D., & Lindee, M. S. (1995). *The DNA mystique: The gene as cultural icon*. New York: Freeman.
- Powell, J. F. (2005). *The first Americans: Race, evolution, and the origin of Native Americans*. New York: Cambridge University Press.
- Putnam, C. (1961). *Race and reason*. Washington, DC: Public Affairs Press.
- Reardon, J. (2005). *Race to the finish: Identity and governance in an age of genomics*. Princeton, NJ: Princeton University Press.
- Ripley, W. Z. (1899). *The races of Europe*. New York: D. Appleton.
- Rosenberg, N. A., Pritchard, J. K., Weber, J. L., Cann, H. M., Kidd, K. K., Zhivotovsky, L. A., et al. (2002). Genetic structure of human populations. *Science*, 298, 2181-2185.
- Sarich, V., & Miele, F. (2004). *Race: The reality of human differences*. New York: Westview.
- Satel, S. (2002, May 5). I am a racially profiling doctor. *New York Times*.
- Schneider, D. M. (1968). *American kinship*. Chicago: University of Chicago Press.
- Serre, D., & Paabo, S. (2004). Evidence for gradients of human genetic diversity within and among continents. *Genome Research*, 14, 1679-1685.
- Small, M. (2006). First soldier of the gene wars. *Archaeology*, 59, 46-51.
- Snyder, L. (1926). Human blood groups: Their inheritance and racial significance. *American Journal of Physical Anthropology*, 9, 233-263.
- Stuham, S. (2000). François Bernier and the invention of racial classification. *History Workshop Journal*, 50, 1-21.
- Subramanian, S. (1995, January 16). The story in our genes. *Time Magazine*, 54-55.

- Templeton, A. R. (1998). Human races: A genetic and evolutionary perspective. *American Anthropologist*, 100, 632-650.
- Thieme, F. P. (1952). The population as a unit of study. *American Anthropologist*, 54, 504-509.
- Tucker, W. H. (2002). *The finding of scientific racism: Wickliffe Draper and the Pioneer Fund*. Urbana: University of Illinois Press.
- Wade, N. (2002, December 20). Gene study identifies 5 main human populations. *New York Times*.
- Washburn, S. L. (1963). The study of race. *American Anthropologist*, 65, 521-531.
- Weiner, J. S. (1957). Physical anthropology: An appraisal. *American Scientist*, 45, 79-87.
- Williams, F. L., Belcher, R., & Armelagos, G. (2005). Forensic misclassification of ancient Nubian crania: Implications for assumptions about human variation. *Current Anthropology*, 46, 340-346.
- Wolf, E. R. (1982). *Europe and the people without history*. Berkeley: University of California Press.

2

What Genes Are and Why There Are No Genes for Race

JOHN DUPRÉ

Talk of the genetic basis of race has resurfaced in the aftermath of spectacular progress in the development of genetic technologies, most especially technologies that provide genetic tests, allegedly "for race," that coincide quite closely with self-reported racial identities. In a much discussed Op-Ed piece for the *New York Times* (March 14, 2005), Armand Leroy, an evolutionary biologist at Imperial College, argued that the classic claim by Richard Lewontin (1972) that human variation was overwhelmingly within rather than between races, so that traditional racial categories could be seen as socioeconomic constructs, was based on an elementary statistical error.¹ Whereas, taking all genes separately, Lewontin's claim was true, the clustering together of genes characteristic of particular groups was able to show a distinctive genetic inheritance to traditional racial groups. These developments carry a significant danger of lending new respectability to controversial speculations about racial differences in such politically charged characteristics as IQ.

Unfortunately, the further these discussions move away from the technical contexts in which these genetic tests originate, the more misunderstandings appear. Other chapters in this volume (see Bolnick, Fullwiley) explain in detail the statistical procedures to which Leroy is referring and the limitations of conclusions drawn from them. As I shall try to show in this chapter, insights from recent genomic science have helped clarify and highlight the ambiguities and misunderstandings that threaten incautious interpretations of genetic data and even of the very concept of a gene. I shall also show how misunderstandings of these concepts can and do lead to spurious conclusions of the kind just outlined with regard to race and that, in