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The Biological Case Against Race

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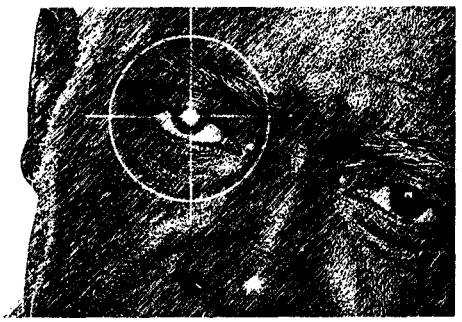
Modern science demonstrates that race is a social concept, not a scientific truth.

Many of our present political and social problems are rooted in racial misconceptions. The tragedy of this is that virtually none of the people directly involved in addressing our political and social disparities fully comprehend how our racial confusion influences how we deal with the consequences of injustice. Racist ideology has always relied on the mistaken assumption that significant biologically based differences exist between various groups of humans. In particular, racist ideology has always assumed that *social* inequality resulted from the *biological* inequality of races. Thus they saw racial differences as determining an individual's morality, character, intelligence, athleticism, and sexuality, among other features. They also thought that these features were immutable and passed directly on to offspring. Seen in this way, society would never change, and injustice could never be eliminated from it, because nature itself had created fundamental genetic differences between the races. Most nineteenth-century Americans never doubted that both God and science declared the existence of race, and that there was a hierarchical relation among the races. According to this thinking, the European stood at the pinnacle of human perfection, and all other races were to be measured against him. For this reason, they thought it legitimate to declare the African slave as chattel and to deprive the American Indians of their sovereignty.

We have come a long way since then. However, our change in thinking did not happen without tremendous struggle; the ideological battle against racism has now been fought across three centuries. Meanwhile, people continue to suffer and die as a consequence of racist policies. Still today the root cause of racism remains entrenched in the American consciousness. Many of us still believe that there are innate racial differences among people, reflected in their character and habits.

The core ideological principle that maintains racism is the mistaken belief that biological races really exist in the human species and that individual aspects of character and morality can be identified by one's racial ancestry. Ironically, race theory is a consequence of relatively modern historical developments. We do not find clearly articulated theories of racial hierarchy in the writings of the ancients. They recognized that human beings had some physical differences from one another and that they had formed different cultures, but they did not believe that any specific race of people was inherently

better than any other. Even Western civilization did not immediately develop substantial ideological support for theories of race classification and racially based variation in character and temperament. Anthropologists in the eighteenth century did not uniformly agree on the superiority of Europeans; Johann Friedrich Blumenbach, considered the founder of anthropology, did not accept the idea that races could be hierarchically classified. Yet by the middle of the nineteenth century, schemes of racial hierarchy would become entrenched. The rise of racial ideology coincided with the rise of Darwinism (specifically, a misunderstanding of how Darwin's observations applied to humans) and the development of social institutions that exploited human biological differences for profit. This meant that a person's West African ancestry could be used as the sole reason to reduce him to chattel slavery, and that a group's American Indian ancestry in itself provided sufficient reason for the partial extermination of their population and seizure of their land.



Development of Biology and Race Theory

Pre-Darwinian biology utilized the "great chain of being" and ranked man higher than all other earthly life forms. This scheme suggested that the supernatural creator was responsible for the hierarchy of life, including the varieties of human beings. Naturalists of this period sought to find objective measurements to validate their beliefs, and turned to activities such as the measuring of skull volumes and other metrics. Not surprisingly, their studies supported the notion of European superiority. Yet to fully understand what modern biologists mean when they talk about race requires reference to evolutionary theory.

Without realizing it, Charles Darwin solved the problem of race when he asked how new species arose in nature. The origin of species was the most important scientific problem of the mid-nineteenth century, equivalent to what the discovery of the structure of DNA or the publication of the human genome was for us in 2001. However, to understand the origin of species, one also had to understand the significance of biological varieties or races, which result from genetic adaptation to local conditions and from chance events in the history of a given species that might radically change its genetic composition. Darwin recognized that the formation of biological varieties or races was essential to the formation of new species. His genius was in appreciating the significance of biological variation within species and the relationship of this variation to how new species were formed. He identified natural selection as the chief mechanism responsible for the adaptation of species to their environments. He thought that natural selection would eventually create varieties sufficiently different in their features so that they would become new species.

After the publication of *The Origin of Species* (1859), Darwin was forced to address the nature of human races. The anthropological debates of the later portion of the nineteenth century had still not yet clarified whether there was one species of modern humans, or whether the races should be considered as separate species. In *The Descent of Man,* published in 1871, Darwin outlined the basic reasoning that still stands today concerning the races of mankind. Darwin pointed out that if we used the techniques that naturalists used to identify race in nonhuman species, we would conclude that there really were no races in anatomically modern humans. Over one hundred and forty years of research have demonstrated that Darwin's reasoning was correct. Today the concept of geographical race is a cornerstone of evolutionary theory. Geographical races or subspecies have significant amounts of gene frequency differences from other such groups (usually on the order of about 20 percent). These differences result from natural selection for localized conditions, unique population history events (such as random fluctuations in population size), and a secession of gene flow with other populations within the species. Geographical races are thus thought to be intermediate steps along the way to the formation of new species. It is because this concept has been so thoroughly investigated that we can say with so much certainty that no biological races exist in modern humans.

Basic Definitions of Race

If humans had biological races, there should be some nontrivial underlying hereditary features shared by a group of people and not present in other groups, or possibly average differences that could be made sense of in some statistical way. Biology has developed relatively precise tools with which to examine whether the hereditary characteristics of populations can be classified into geographical races. It is here that the Western socially defined concept of "race" and the biological concept of race diverge. When one attempts to examine any of the physical features that have been used to define human races in our history, the concept breaks down. Skin color, hair type, body stature, blood groups, disease prevalence: none of these unambiguously corresponds to the "racial" groups that we have socially constructed. Thus, the common person distinguishes what he or she perceives to be racial categories by observable physical traits. These physical traits do vary among geographical populations, although not in the ways most people believe. For example, Sri Lankans of the Indian subcontinent, Nigerians, and Australoids share a dark skin tone, but differ in hair type and genetic predisposition to various diseases. Further difficulty results from the fact that people commonly link directly observable physical variation with less directly observable variation in such attributes as intelligence, motivation, and morality.

Modern biology defines geographical races as equivalent to subspecies. Subspecies are units that are intermediate to legitimate species. The biological species concept relies on whether individuals in such groups cannot mate and form fertile offspring. Horses and donkeys are considered legitimate species; if they are mated, mules result, but these are sterile. Also, gorilla and chimpanzees are separate species; yet within gorillas, mountain and forest gorillas might be considered subspecies, or geographical races of gorillas. No such level of genetic variation exists within anatomically modern humans. There is more genetic variation within one tribe of wild chimpanzees than has been observed within all existing humans! (See P. Gagneux, C. Willis, and U. Gerloff,

"Mitochondrial Sequences Show Diverse Evolutionary Sequences of African Hominids," *Proceedings of the National Academy of Sciences USA* 96 [1999]: 5077-5082.)

Genes, Human Variation, and Race

Only a fraction of the genetic information contained in the human genome has ever had anything to do with creating the geographic variation associated with what has been historically called race. The DNA molecule in organisms like humans is associated with a group of proteins called histones. Together these make up a structure called the chromosome. Humans have 23 pairs of chromosomes, with one set inherited from the mother and the other from the father. Along the DNA chain we can identify specific points, called *loci,* that are responsible for providing the instructions for a given trait, such as eye color. Some loci, called monomorphic (or one form) loci, control traits that are so crucial for the organism's function that no alteration of the genetic code is allowed. Loci that can allow genetic variation, usually because their functions are not as constrained as monomorphic loci, are called polymorphic (many forms). Polymorphic loci are defined by the presence of at least one rare variant, called an allele, that can be found at a frequency greater than 1 percent. A good example of a polymorphic locus is the A, B, and O blood group antigens. Polymorphisms occur when natural selection against any particular allele is weak, thus allowing all of them to persist in populations at different frequencies. We might find that a given allele is better under one set of conditions, yet others are favored if we change the conditions. For example, alleles that produce darker skin are slightly favored in the tropics, as opposed to alleles that produce lighter skin in the temperate zones. The dark skin in the tropics might give better protection against ultraviolet light (UV) damage in the skin, or against skin parasites, while lighter skin in temperate zones might help with the synthesis of vitamin D (a hormone). In such a case, as the intensity of sunlight changes, we would expect to find a continuous change in the frequency of the alleles associated with changes in skin color. That is precisely what we find when we examine alleles for vitamin D binding proteins from the tropics to the northern latitudes. However, the whole story of skin pigmentation isn't as simple as that. Human pigmentation is genetically complex, and we can only say with certainty that variation at only one locus, the melanocortin-1 receptor (MC1-R), can be definitely associated with physiological variation in hair and skin color. The authors of a recent study sequenced that gene from one hundred twenty-one individuals from different geographical regions. DNA has four nitrogenous chemical bases called nucleotides: adenine (A), thymine (T), guanine (G), and cytosine (C). These bases are aligned in various orders and constitute the chemical message of the DNA molecule that directs the synthesis of messenger RNA, and eventually the protein. Gene sequencing is the process by which geneticists determine the nucleotide structure of the DNA within a specific region of the molecule. The different nucleotide sequences are the molecular basis for what we call alleles. The authors found that there were five alleles for the MC1-R gene. The original protein sequence was observed in all of the African individuals studied, but it was also found in the other world populations at lower frequencies (see B. K. Rana et al., "High Polymorphism at the Human Melanocortin 1 Receptor Locus," *Genetics* 151, no. 4 [April 1999]: 1547-57). We also know that skin color in sub-Saharan African populations is more variable than that found in any other of the world's populations. This is also true of total genetic diversity and physical variables such as skull types (see J. H. Relethford, "Human Skin Color Diversity Is Highest in Sub-Saharan African Populations," *Human Biology* 72, no. 5 [October 2000]: 773-80). These observations alone shed doubt on whether we can truly divide the human species into discrete racial groups.

Genetic Variation Within and Between Races

There are statistical ways to summarize the similarity between human populations with regard to overall allele frequency. For example at the histocompatibility antigen A (HLA-A) locus, African-, Asian-, and European-Americans are quite similar in their allele frequencies. The HLA loci are responsible for tissue recognition and play an important role in warding off disease. We can further investigate the frequencies of alleles at other loci, and we can also statistically determine what the genetic distances are between socially constructed racial groups. This has been accomplished for modern human beings, and we have learned that there is about 8.5 times more genetic variation within the classically defined racial groups as there is between them. Another way of stating this is that 85 percent of the genetic variation within modern humans occurs at the individual level, 5 percent occurs between populations found on the same continent, and 10 percent occurs between continents. This general rule can be violated in groups that were originally generated from small groups that were themselves genetically uniform, or for cultural reasons maintained marriages amongst themselves. However, this special case does not invalidate the general principle that the majority of genetic variation in humans occurs between individuals, without regard to membership in a socially constructed race.

A particularly illustrative example of the fallacy of the race concept occurs when we compare socially defined human races to populations in other species that have been defined by biologists as geographical races or subspecies. The standard figure for identifying the existence of geographic races is usually about 20 percent total genetic distance between populations at polymorphic loci. This has been observed in various drosophila (fruit flies) species, but we don't see anywhere near that much geographical variation in modern humans. The estimates we have of the amount of variation between human populations varies between 3 and 7 percent at the polymorphic loci (see my book, *The Emperor's New Clothes: Biological Theories of Race at the Millennium* [Rutgers University Press, 2001], 204). Again, because polymorphic loci only represent about 33 percent of the human genome, the total amount of genetic distance we observe in humans is between (0.03 x 0.33 = 0.0099) and (0.07 x 0.33 = 0.023). This value is ten times below the 0.20 (20 percent) figure. It is apparent that different standards of biological rea-

soning would have to be used to make the argument for the existence of enough genetic distance in modern humans to support the existence of biological races.

Neither is there any evidence that existing populations or the socially defined human races exist as distinct evolutionary lineages. In this sense, an evolutionary lineage would be a population of humans that was isolated from genetic intermixture with other humans. We would expect such lineages to exist, particularly when individuals within a species are limited in their dispersal ability and thus cannot move around to encounter individuals of other lineages to reproduce. Population geneticists have various means to test for the existence of such lineages. One way is to calculate the amount of population subdivision that exists in the human species. Population subdivision is a measure of how uniformly the genetic information of a population is distributed between groups. In other words, we would expect a species that has unique lineages within it to be subdivided. The population subdivision statistic can take on values from 0.0 (no subdivision) to 1.0 (completely divided). Furthermore, the statistic allows one to compare how subdivided various species are relative to others. This analysis has been done for modern humans and they have been compared to other large-bodied mammals with good dispersal capacity. On one end are organisms showing strong subdivision, such as the Gray Wolf with figures on the order of 0.67, 0.78, or 0.80; while on the other end we see the African buffalo (0.08), the Kenyan waterbuck (0.12), and the modern human (0.156), showing very weak subdivision. Finally, molecular genealogy of human populations have also been examined to discern whether these show unique genetic lineages. Thus far, all the human genetic distance data derived from nuclear genes fails to fit this pattern (see A. R. Templeton, "The Genetic and Evolutionary Significance of Human Races," in *Understanding Race and Intelligence,* ed. J. Fish [Lawrence Erlbaum Associates, 2002], 31-56).

Modern Genome Studies Dismiss Biological Races

Advances in analyzing human genetic variation at the genome level have sounded the death knell for the socially defined concept of race. In February of 2001, Celera Genomics CEO Craig Venter commented that it was not possible to distinguish at the genome level between people who were ethnically African-American, Chinese, Hispanic, and white. Celera's sequencing of the human genome showed that the average pair of human beings who are not close relatives differ by 2.1 million genetic letters, yet only a few thousand of those differences account for the biological differences between individuals. Venter argued that we were all essentially identical twins at the level of the genome. Celera used DNA extracted from five volunteers: three women and two men. They described the participants in their study as "ethnically African-American, Chinese, Hispanic, and white." Their results showed that at the DNA level you could clearly tell the females from the males (due to the genetic differences in the X and Y chromosomes), but you could not identify the socially constructed race of the individual from the DNA. Ventor concluded that "race is not a scientific concept" (see Maggie Fox, "First Look at Human Genome Shows How Little There Is," Reuters news service, updated 8:20 A.M. ET, February 11, 2001).

Since then, other studies have supported this general conclusion, including a recent examination of single nucleotide polymorphisms (called SNPs and pronounced *snips*). SNPs result when an individual has a substitution for the most common nucleotide for a given position within a gene. The fact that we are so genetically similar in our nucleotide sequences makes it interesting to look at the effect of single substitutions at any portion of the DNA code. It is believed that these polymorphisms may be particularly important in determining disease predisposition. A recent study examined three hundred thirteen human genes from individuals in four American ethnic groups for SNPs (see J. C. Stephens et al., "Haplotype Variation and Linkage Disequilibrium in 313 Human Genes," *Science* 293 [July 20, 2001]: 489-492). They described their subjects as Asians, Caucasians, African Americans, and Hispanics-Latinos. Of the SNPs examined, 21 percent were found in all groups (cosmopolitan), approximately 9.3 percent were found in three of four groups, and approximately 10 percent were found in two of four groups. They also looked at associations between two SNPs within a gene called haplotypes. This term refers to combinations of genes at two loci that occur together more than would be expected by chance alone. This might occur if natural selection favored the association of the two genes. In this study, pairs of SNPs within each of the genes examined were analyzed to see if they fit the definition of haplotypes. Populations from different portions of the world might be expected to differ in haplotype diversity due either to natural selection or to historical accidents of population structure. In the end, however, their haplotype data gave the same general result as predicted from the single SNPs.

Some might take these results to counter the idea that races do not exist in the human species. After all, some SNPs are only found in specific ethnic groups. However, this study was not designed as a thorough examination of worldwide genetic diversity. The study did not sample DNA from all the populations that comprise the human genetic spectrum, nor were large numbers of individuals from each region sampled. Yet they still showed that the majority of SNP variation occurred at the level of individuals within populations (about 85 percent) as compared to variation between populations (about 15 percent). This result confirms all the earlier studies of human genetic variation and is further indication of the fallacy of race at the biological level (see Stephens et al., 492).

Practical Implications of the Race Fallacy

In my recent book, *The Emperor's New Clothes,* I demonstrated that our social construction of race was contingent upon the assumption that significant biological variation between groups of human beings existed that could be used to identify and classify these same races. Scientists now know that this was a false proposition, both at the level of the physical features and of the genes that produce them. Yet most Americans still believe that there is some biological legitimacy to our socially constructed racial categories. However, our modern scientific understanding of human genetic diversity flies in the face of all of our social stereotypes. Thus, if we cannot apportion humans into the socially constructed groups of American society, how can there be a genetic basis to the physical and behavioral features that have been ascribed to these mythological groups? In reality, the differences between groups we have been describing as resulting from biological race are really the result of cultural

evolution. The rules that govern cultural evolution are dictated by the views of the eighteenth-century biologist Jean Baptist Lamarck, not those of Darwin. That is, cultural evolution occurs by the inheritance of acquired characteristics, and cultures change far more rapidly than genetic material. Thus, the social construction of race was a feature of our recent cultural evolution. Our reliance on racial thinking can just as easily be deconstructed.

To begin the deconstruction of racism, we must ask ourselves what role racist ideology plays in modern society. First, it provides a moral justification for maintaining a society that routinely deprives various groups of its rights and privileges. Racist beliefs discourage subordinate people from attempting to question their lowly status; to do so is to question the very foundations of the society. In addition, racism focuses social uncertainty on a specific threat, thus justifying existing practices and serving as a rallying point for social movements. Finally, racist myths encourage support for the existing order. Thus it is argued that if there were any major societal change, the subordinate group would suffer even greater poverty and the dominant group would suffer lower living standards. History demonstrates that racial ideology increases when a value system is under attack.

However, nothing comes without cost. There are at least seven ways in which racism is dysfunctional to a society, even for a dominant group:

- Discriminatory practices prevent society from benefiting from the contributions of all individuals. Discrimination limits the search for talent and leadership to the dominant group. Racists may also view "inferior" people as a physical resource, apportioned in the social division of labor, for the benefit of the superior "race." Such practices are always economically inefficient.
- Discrimination aggravates social problems such as poverty, delinquency, and crime, and places the financial burden of alleviating these problems on the dominant group.
- Society must invest a good deal of time and money to defend the social and institutional barriers that prevent the full participation of all members.
- Racial prejudice and discrimination undercut diplomatic relations among nations. They also negatively affect efforts to increase global trade and world peace.
- Communication among groups is restricted. Little accurate knowledge of the minority and its culture is available to the society at large.
- Social change is inhibited because change may assist a subordinate group.
- Discrimination promotes disrespect for law enforcement, the rule of law, and the peaceful settlement of disputes.

Thus, even if one has no moral commitment to ending racism, there is much evidence that it contributes significantly to social dysfunction. Therefore, we all win if we recognize that the proverbial emperor, race, is naked.

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