AMER. ZOOL., 26:857–887 (1986)

Geneticists and Race[1]

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SYNOPSIS. During the twentieth century, geneticists have dramatically changed their assessments of the biological and social consequences of human race differences and race crossing. In the first quarter of the century, most geneticists thought that human races differed hereditarily by important mental as well as physical differences and that wide race crosses were biologically and socially harmful. The period from 1925 to the outbreak of World War II saw no change in geneticists' views on hereditary mental differences between human races, but a shift to agnosticism on the issue of wide race crosses. By the early 1950s, geneticists generally argued that wide race crosses were at worst biologically harmless, but still held to earlier beliefs about hereditary mental differences between races. The final period from 1951 to the present has witnessed the shift to agnosticism on the issue of hereditary mental differences between races. The changes in geneticists' assessments of race differences and race crossing were caused by increased understanding of the complex relationship between genes and environment and by cultural changes.

INTRODUCTION

The current assessment of geneticists regarding the issue of genetics and race is easily stated at the outset. "There is no convincing evidence as to whether there is or is not an appreciable genetic difference in intelligence between races" (Genetics Society of America Resolution on Genetics, Race and Intelligence, 1976). "There is no evidence that race mixture produces disadvantageous results from a biological point of view" (UNESCO Statement on the Nature of Race and Race Differences, 1951). These two direct statements accurately represent the current state of scientific knowledge on genetics and race.

In isolation, however, these statements reveal little about the reasons for the intense controversies over genetics and race that have raged in the twentieth century or about the contributions that geneticists have made to the controversies. In this essay, which is a necessarily brief summary of a book that I am writing on geneticists and race, I will attempt to place the current assessment of geneticists into historical perspective, perhaps the best way to understand the significance of their current position on genetics and race.

This essay builds directly upon the historical framework provided in John Moore's introductory essay, which should be read first. The essay begins with the nineteenth century background before turning to developments in the twentieth century, which can be conveniently divided into the following four periods. The first, from 1900 to 1924, saw the dominance of the beliefs that human races differed hereditarily by important mental as well as physical traits, and that crosses between widely different races were biologically harmful. The second, from 1925 to 1939, saw no change in geneticists' attitudes about race differences but a shift to agnosticism on the issue of wide race crosses. In the third period, 1940 to 1951, geneticists reversed their views on race crossing and argued that wide race crosses were at worst biologically harmless, but most geneticists still held to older views about hereditary racial differences in mentality. The final period, 1951 to the present, witnessed the shift to agnosticism on the issue of hereditary mental differences between races.

THE NINETEENTH CENTURY BACKGROUND

Between 1860 and 1900 Americans and Europeans felt a new urgency about problems associated with race differences. The U.S. Civil War and the freeing of slaves precipitated an outpouring of writings about race. Europeans divided up the entire continent of Africa and increased imperi-

[1] From the Symposium on *Science as a Way of Knowing—Genetics* presented at the Annual Meeting of the American Society of Zoologists, 27–30 December 1985, at Baltimore, Maryland.

alistic activities throughout the world, dramatically increasing their interactions with other races. Race-related social issues grew accordingly.

Biological conceptions of race differences and race crossing did not begin with the rediscovery of Mendelian heredity in 1900. Many of the ideas expressed by geneticists in the early twentieth century were earlier expressed by biologists in the late nineteenth century. Indeed, the views of geneticists on the question of race in the early heyday of their new field were inevitably drawn from the cultural context and scientific knowledge of the late nineteenth century. Despite a wide range of criteria for judging the taxonomic status of racial groups in animals, nineteenth century biologists agreed that Australian aborigines, African blacks, South American Indians, orientals, and white Europeans were of different racial groupings.

The foremost thing to understand about the attitudes of nineteenth century biologists is that they were in general far more hereditarian in their outlook than are biologists today. We know vastly more about mechanisms of heredity and have documented a huge number of cases of inheritance. But geneticists today also know a great deal about clearly measurable individual differences that are inherited weakly if at all and are well aware that the whole concept of inheritance (heritability) may depend strongly upon the particular environment in which the measurement is made. Thus geneticists generally know that they must be very careful in generalizing from within-group heritability (measured in a single environment) to heritability of differences in the same character between groups that may have been subjected to different environments. Compared to Charles Darwin, Edward O. Wilson and Arthur R. Jensen, both of whom now have widespread reputations as ardent hereditarians regarding human behavior, must be ranked as strong environmentalists.

Charles Darwin

Darwin was certainly the most influential biologist of the nineteenth century. On the voyage of the *Beagle* (December 1831 to October 1836) he observed African blacks, South American Indians (including the Fuegians), South Sea islanders, and Australian aborigines among others and he had no doubt that they were distinguishable races of humans and that their differences in physical characters, from facial features and hair to height and skin color, were inherited. He also thought the evidence for hereditary mental differences between human races was incontrovertible. When he first saw native Fuegians on the east coast of Tierra del Fuego in December 1832, he wrote a friend:

> I have seen nothing which more completely astonished me than the first sight of a savage. It was a naked Fuegian, his long hair blowing about, his face besmeared with paint . . . . Standing on a rock he uttered tones and made gesticulations, than which the cries of domestic animals are far more intelligible. (Darwin, 1887, I, pp. 255–256)

Recalling this same incident in his *Journal of Researches,* Darwin commented:

> I do not believe it is possible to describe or paint the difference between the savage and civilized man. It is the difference between a wild and tame animal: and part of the interest in beholding a savage, is the same which would lead every one to desire to see the lion in his desert, the tiger tearing his prey in the jungle, the rhinocerous on the wide plain, or the hippopotamus wallowing in the mud of some African river. (Darwin, 1839, p. 606)

Darwin clearly believed that the mental differences between civilized man (white Europeans in particular) and savage races had evolved primarily through natural selection and were in large part hereditary. As Darwin wrote to his friend Charles Lyell,

> I suppose that you do not doubt that the intellectual powers are as important for the welfare of each being as corporeal structure; if so, I can see no difficulty in the most intellectual individuals of a species being continually selected; and the intellect of the new species thus

> improved, aided probably by effects of inherited mental exercise. I look at this process as now going on with the races of man; the less intellectual races being exterminated. (Darwin, 1887, II, p. 211)

In his lifetime Darwin witnessed the elimination of the Tasmanian aborigines. He was so certain that white Europeans would eliminate the lower human races that he predicted the gap between the anthropoid apes and humans would become larger. He thought the only possible escape from extinction for many of the lower races was to cross with other more intellectual races, much as some biologists now recommend the cross-breeding of some rare raptors with more numerous closely related varieties.

At the same time, he was aware that cultural forces could significantly alter behavioral patterns. He frequently argued that slavery, which he detested, was a major cause for the degradation of the native Africans. In his *Journal of Researches* from the voyage of the *Beagle*, Darwin tells of one incident that showed him how significantly slavery could depress the mental state of a human being. He was on a ferry with a Negro man, a slave, who was described to him as "uncommonly stupid." Darwin gestured with his hands to communicate better; the man, thinking Darwin was going to hit him, cringed in preparation for a blow. Darwin recalled: "I shall never forget my feelings of surprise, disgust, and shame, at seeing a great powerful man afraid even to ward off a blow, directed, as he thought, at his face. This man had been trained to a degradation lower than the slavery of the most helpless animal" (Darwin, 1839, p. 28). To counteract the common opinion about the very low intelligence and capabilities of Negroes, Darwin on many occasions expressed his higher opinion of them in his writings and personal correspondence.

Defending African blacks against the views of pro-slavery Englishmen did not, however, mean that Darwin believed there were no significant hereditary mental differences between blacks and white Europeans. Darwin had himself observed the results of an experiment to turn Fuegians into civilized persons. On board the *Beagle* were four English speaking Fuegians, whom Captain Fitzroy had brought to England on a previous voyage. These Fuegians had acquired many civilized traits in addition to the language, and Fitzroy hoped that when returned to their native land they would foment the spread of civilized habits through the population of Tierra del Fuego. Darwin observed the differences between the "civilized" and uncivilized Fuegians and accordingly believed that the capacity for civilization was significantly present in Fuegians. But the "civilized" Fuegians quickly reverted to primitive life when left for a year in their native land, as Darwin observed when the *Beagle* next visited Tierra del Fuego. This he found disappointing but hardly surprising. He commented that the Fuegians "skill in some respects may be compared to the instincts of animals; for it is not improved by experience," and that "nature by making habit omnipotent, and its effects hereditary, has fitted the Fuegian to the climate and the productions of his country" (Darwin, 1839, pp. 236–237).

Darwin summarized his views of race differences in his *Descent of Man*. There is, he said,

> No doubt that the various races, when carefully compared and measured, differ much from each other—as in the texture of the hair, the relative proportions of all parts of the body, the capacity of the lungs, the form and capacity of the skull, and even in the convolutions of the brain. But it would be an endless task to specify the numerous points of structural difference. The races differ also in constitution, in acclimatization, and in liability to certain diseases. Their mental characteristics are likewise very distinct; chiefly as it would appear in their emotional, but partly in their intellectual faculties. Every one who has had the opportunity of comparison, must have been struck with the contrast between the taciturn, even morose, aborigines of South America and the light-hearted, talkative negroes. There is a nearly sim-

> ilar contrast between the Malays and the Papuans, who live under the same physical conditions, and are separated from each other only by a narrow space of sea. (Darwin, 1871, I, pp. 216–217)

Darwin harbored no antagonism toward any human race. He believed all humans should treat each other with respect and compassion. Yet he was certain that no amount of humanistic feeling or environmental manipulation could possibly remove entirely those racial differences erected by nature. There was no use pretending human races had equal mental capacities.

One must appreciate that Darwin saw the question of racial differences in mentality from a very different perspective than do geneticists at present. Two aspects of Darwin's background are especially important in relation to his observations. First, he knew a great deal about animal and plant breeding and he relied heavily upon the opinions of breeders. Even more than the general population, breeders believed that virtually all differences in physical features or behavior had a hereditary component. That was why they had been able to produce a diversity of domesticated animals, all with their different physiques and characteristic behavior patterns. Second, he belonged to a culture that emphasized hereditarian views, in particular that Caucasians were superior to all other races. Darwin observed differences in mental abilities to perform certain tasks. He concluded that these differences resulted from hereditary differences. For Darwin and his contemporaries, the scientific evidence for hereditary mental differences between human races was overwhelming. In his day, this conclusion was good science; indeed, the best.

Thomas Henry Huxley

Like Darwin, Thomas Henry Huxley was strongly opposed to slavery and championed the liberal view that all people should be freed from any fetters that traditional society had placed upon them. In 1865, as the Civil War in the United States was ending, he wrote an essay entitled "Emancipation—Black and White." He argued strongly that blacks and white women should be given the same opportunities in society as white men.

When freed of social fetters, would women and blacks equal the achievements of white men? Huxley answered:

> It may be quite true that some negroes are better than some white men; but no rational man, cognizant of the facts, believes that the average negro is the equal, still less the superior, of the average white man. And, if this be true, it is simply incredible that, when all his disabilities are removed, and our prognathous relative has a fair field and no favour, as well as no oppressor, he will be able to compete successfully with his bigger-brained and smaller-jawed rival, in a contest which is to be carried on by thoughts and not by bites. The highest places in the hierarchy of civilization will assuredly not be within the reach of our dusky cousins, though it is by no means necessary that they should be restricted to the lowest.
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> The big chests, the massive brains, the vigourous muscles and stout frames, of the best men will carry the day, whenever it is worth their while to contest the prizes of life with the best women. (T. H. Huxley, 1871, pp. 20–21, 25)

Huxley's conclusion might easily have been said by a geneticist of today. "The duty of man is to see that not a grain is piled upon that load beyond what Nature imposes; that injustice is not added to inequality" (p. 26). Darwin would have agreed. So far as treatment under the law is concerned, the position of Huxley and Darwin is very similar to that of Martin Luther King. But the truth is that Darwin and Huxley also believed there was no chance blacks or women could on the average equal the achievements of white men. I cannot emphasize too strongly that both Darwin and Huxley clearly understood that the social policy they advocated stemmed from the kind of society they wanted (one with legal equality), not from their scientific knowledge of hereditary mental differences between races.

Francis Galton and the distribution of intelligence among races

Even before Darwin published the *Descent of Man* most biologists in England, on the Continent, and in America believed races to differ hereditarily in intelligence. The more interesting problem for them was to judge degrees of intelligence in races. What was needed was a quantitative, scientific method for comparing intelligence in different races. Darwin's half-cousin, Francis Galton, invented that method.

Galton, an Englishman, traveled widely in north and south Africa between 1845 and 1852. He observed many African tribes and became very interested in what he called "the mental peculiarities of different races." He was much influenced by Charles Darwin's works on evolution and heredity, especially the *Variation of Animals and Plants Under Domestication,* which Darwin published in 1868. Galton began a study of the inheritance of mental traits in the mid-1860s, culminating in the publication of his book *Hereditary Genius* in 1869. In that book Galton presented an analysis of the mathematical distribution of intelligence in human populations, and he proposed a method for quantitatively comparing intelligence in different races.

Reasoning from a study of the distribution of heights of French soldiers by the Belgian statistician Quetelet, who found a normal (or "bell curve") distribution, Galton argued that "if this be the case with stature, then it will be true as regards every other physical feature—as circumference of head, size of brain, weight of grey matter, number of brain fibres, etc.; and thence, by a step on which no physiologist will hesitate, as regards mental capacity" (Galton, 1869, pp. 31–32). Having established in earlier chapters that about 250 men per million in England fit his definition of eminent, Galton constructed a normal distributive curve for one million men divided into fourteen grades, the top two of which (plus the upper tail of the distribution, in this case containing one individual) contained 248 men. Table 1 is based on this analysis (Galton, 1869, p. 34). The table was quantitative and exact. Galton urged the reader to understand

> that the numbers of men in the several classes in my table depend on no uncertain hypothesis. They are determined by the assured law of deviations from an average. It is an absolute fact that if we pick out of each million the one man who is naturally the ablest, and also the one man who is the most stupid, and divide the remaining 999,998 men into fourteen classes, the average ability in each being separated from that of its neighbors by *equal grades,* then the numbers in each of those classes will, on the average of many millions, be as is stated in the table. The table may be applied to special, just as truly as to general ability. It would be true for every examination that brought out natural gifts, whether held in painting, in music, or in statesmanship. The proportions between the different classes would be identical in all these cases, although the classes would be made up of different individuals, according as the examination differed in its purport. (Galton, 1869, pp. 34–35)

Of course Galton's table had to be correct, supposing intelligence was normally distributed; but he had no evidence for that except for his suggestive analogy with distribution of height. A second problem that Galton minimized here was the identification of the individuals who belonged in each category. But one element of Galton's genius was an ability to forge ahead, brushing major and minor difficulties aside.

Using his table for a working model for the distribution of intelligence, Galton assessed the comparative intellectual worth of different races. Like Darwin, Wallace, and Huxley, Galton rejected the simplistic thesis that all members of one race might be inferior to all members of another. When the well-known anthropologist James Hunt delivered a paper on the Negro at the ethnology section of the British Association Meeting of 1863 and claimed that no "pure Negro ever advances further in intellect than an intelligent European boy of fourteen years of age," Galton, as sum-

TABLE 1. *Classification of men according to their natural gifts.*

Grades of natural ability, separated by equal intervals		Numbers of men comprised in the several grades of natural ability, whether in respect to their general powers, or to special aptitudes							
				In total male population of the United Kingdom, say 15 millions, of the undermentioned ages:					
Below average	Above average	Proportionate, viz. one in	In each million of the same age	20–30	30–40	40–50	50–60	60–70	70–80
a	A	4	256,791	641,000	495,000	391,000	268,000	171,000	77,000
b	B	6	161,279	409,000	312,000	246,000	168,000	107,000	48,000
c	C	16	63,563	161,000	123,000	97,000	66,000	42,000	19,000
d	D	64	15,696	39,800	30,300	23,900	16,400	10,400	4,700
e	E	413	2,423	6,100	4,700	3,700	2,520	1,600	729
f	F	4,300	233	590	450	355	243	155	70
g	G	79,000	14	35	27	21	15	9	4
x	X								
all grades below g	all grades above G	1,000,000	1	3	2	2	2	—	—
	On either side of average		500,000	1,268,000	964,000	761,000	521,000	332,000	149,000
	Total, both sides		1,000,000	2,536,000	1,928,000	1,522,000	1,042,000	664,000	298,000

The proportions of men living at different ages are calculated from the proportions that are true for England and Wales. (Census 1861, Appendix, p. 107.)

Example.—The class F contains 1 in every 4,300 men. In other words, there are 233 of that class in each million of men. The same is true of class f. In the whole United Kingdom there are 590 men of class F (and the same number of f) between the ages of 20 and 30; 450 between the ages of 30 and 40; and so on.

marized by the *Anthropological Review*, replied that "the Negro, though on the average extremely base, was by no means a member of a race lying at a dead level. On the contrary, it had the capacity of frequently producing able men capable of taking an equal position with Europeans. The fact of a race being distinguished by the diversity of its members was well known to the ethnologists." In short, Galton believed that the intelligence of a person was not determined by his race, but that races differed in average intelligence. Galton, like almost all twentieth century geneticists who addressed problems of race differences, was well aware that differences within a racial group were far greater than the differences between racial groups. Thus in this respect Galton may be classified as a populational thinker rather than a racial typologist (a distinction popularized by Ernst Mayr).

Assuming that all races had normal distributions of intelligence, Galton proceeded to compare the intelligences of Englishmen, Negroes, and the Athenians of fifth century B.C. He claimed the intellectual standard of Negroes was about two grades below that of Englishmen for the following reasons. (1) The best Negroes, like Toussaint l'Ouverture, were at least two grades below the best Englishmen; (2) Negroes produced some men "considerably raised above the average of whites"; (3) White travelers who met native Negro chiefs rarely felt inferior to them (What happened when travelers met native chiefs? Said Galton, "The result is familar enough—the white traveller almost invariably holds his own in their presence. It is seldom that we hear of a white traveller meeting with a black chief whom he feels to be the better man. I have often discussed this subject with competent persons, and can only recall a few cases of the inferiority of the white man,—certainly not more than might be ascribed to an average actual difference of three grades, of which one may be due to the relative demerits of native education, and the remaining two to a difference in natural gifts."); and (4) Negroes produced many half-witted men. Next Galton produced similar evidence demonstrating that the Athenians had possessed average ability, "on the lowest possible estimate, very nearly two grades higher than our own—that is, about as much as our race is above that of the African negro." Australian aborigines were at least one grade below Negroes. And Lowland Scotch and English North-country men were "decidedly a fraction of a grade superior to that of the ordinary English." The essential argument was that all grades of intelligence, except the extremes, occurred in all of these "races," but the numbers of individuals in each grade differed in accordance with the average of the race (Galton, 1869, pp. 338–339, 340, 342).

Galton's evidence for his thesis about racial differences in intelligence appears ludicrous from the modern perspective. But Galton, and many of his readers, believed he was making quantitative scientific judgments where others had prevously made subjective guesses.

Like Wallace and Darwin, Galton believed that average differences of intelligence between classes or races were of much social importance. "If we could raise the average standard of our race only one grade, what vast changes would be produced?" From his table reproduced above (fourth column) Galton pointed out that instead of 233 men of high eminence in grade F, there would now be 2,423, an increase of more than a factor of ten. And the numbers of those of higher intelligence would show an even greater increase. This increase of talented men would be a great boon to society, Galton said, because "we know how intimately the course of events is dependent upon the thoughts of a few illustrious men." Consequently, he believed it "most essential to the well-being of future generations, that the average standard of ability of the present time should be raised" (Galton, 1869, pp. 343–344). Civilization was rapidly becoming industrialized and complicated, and more intelligent people were needed to carry out the tasks of society. An added benefit would be the elimination of the least intelligent members of society. It is hardly surprising that when Galton invented the science of eugenics, defined by him as "giving the more suitable races or strains of blood a better chance of

prevailing speedily over the less suitable," he could also say: "There exists a sentiment, for the most part quite unreasonable, against the gradual extinction of an inferior race" (Galton, 1883, pp. 25, 308).

Conclusion

I have presented the views of Darwin, Huxley, and Galton in this section because their views on race differences fairly represent the general attitude not only in England but in Europe, Russia, America, and elsewhere. Moreover, all three were highly respected and influential scientists. The power of their views can be assessed by the reaction to them by a scientist such as Franz Boas, one of the most influential anthropologists of the early twentieth century. He was a Jew born and educated in Germany, where his bad experiences with race prejudice as a youth led him to detest ideas of race inequality. When he turned his attention seriously to the study of man, Boas would have liked to argue that no significant hereditary mental differences existed between races. In 1894 Boas was Vice-President of the anthropological section of the American Association for the Advancement of Science and at the annual meeting he delivered a major address entitled "Human Faculty as Determined by Race." He began the address by challenging the common belief that the white race had to be hereditarily superior to other races because their civilization was demonstrably superior. Other races had not received the same advantages as whites, he argued; we should not conclude that primitive races were incapable of rising to higher levels of civilization.

The scientific arguments, especially those of Galton, compelled Boas, against his own humanitarian desires, to conclude that significant hereditary differences in average mental capacity probably did exist between races. He concluded:

> It does not seem probable that the minds of races which show variations in their anatomical structure should act in exactly the same manner. Differences of structure must be accompanied by differences of function, physiological as well as psychological; and, as we found clear evidence of difference in structure between the races, so we must anticipate that differences in mental characteristics will be found. Thus, a smaller size or lesser number of nervous elements would probably entail loss of mental energy, and paucity of connections in the central nervous system would produce sluggishness of the mind. As stated before, it seems probable that some differences of this character will be found between the white and negro, for instance, but they have not been proved yet. (Boas, 1894, p. 323)

Explicitly using Galton's model, Boas also concluded that all human races had sufficiently similar capacities that all were capable of attaining high levels of civilization:

> The average faculty of the white race is found to the same degree in a large proportion of individuals of all other races, and although it is probable that some of these races may not produce as large a proportion of great men as our own race, there is no reason to suppose that they are unable to reach the level of civilization represented by the bulk of our own people. (Boas, 1894, p. 327)

Twenty-five years after the "Human Faculty" paper, after researchers found a very low correlation between IQ and cranial measurements, Boas was delighted to be rid of his earlier position. But in 1894 the scientific evidence for hereditary racial differences in mental capacity seemed overwhelming. Common sense observation demonstrated to most white observers that Fuegians or Australian aborigines or Negroes had less intelligence than whites. The great evolutionary biologists, led by Darwin, all believed that races differed hereditarily in average levels of intelligence. Galton had furnished a quantitative model that neatly incorporated this belief. Thus in the late nineteenth century the person who denied inherent racial differences in intelligence was, by the highest scientific standards of the time, simply being unscientific.

Stephen Jay Gould in his book *The Mis-*

measure of Man (1981) has strongly emphasized the role played by craniometry in the scientific arguments about hereditary differences in intelligence between races during the nineteenth century. I would emphasize here that many other lines of scientific evidence led in the same direction. Darwin, Huxley, and Galton all believed they were making reasonable deductions from abundant evidence ranging from inheritance in domestic animals to observed behavior patterns exhibited by the Fuegians transplanted to England or African tribesmen in their native settings. It was not bad science by the standards of the time that led to the scientific conception of hereditary mental differences between races, it was good science. By present standards, of course, the evidence, arguments and conclusions of Darwin, Huxley, and Galton would be bad science.

GENETICS AND RACE: THE RISE OF MENDELIAN GENETICS

After the rediscovery of Mendelian heredity in 1900 and geneticists successfully solved previously inscrutable problems, their confidence in the wide applicability and significance of genetics grew accordingly. The high spirits of the time were expressed by the English geneticist R. C. Punnett in his little textbook, *Mendelism.* First published in 1905, it was quickly sold out and a new edition called for in 1907. In the preface to the second edition Punnett was enthusiastic about the progress shown since the first edition and commented: "As year follows year, and experiment succeeds experiment, there is forced upon us a sense of what it all may come to signify for ourselves, of the tremendous powers of control that a knowledge of heredity implies." His concluding words in the book were more explicit. "The facts of heredity," he said, "speak with no uncertain voice":

> Education is to man what manure is to the pea. The educated are in themselves the better for it, but their experience will alter not one jot the irrevocable nature of their offspring. Permanent progress is a question of breeding rather than of pedagogics; a matter of gametes, not of training. As our knowledge of heredity clears, and the mists of superstition are dispelled, there grows upon us with an ever-increasing and relentless force the conviction that the creature is not made but born. (Punnett, 1907, pp. 80–81)

Ten years later, Punnett was more skeptical about the possibility of genetic cures for social problems. But in 1907 he expressed the hopes of many geneticists who found very appealing the prospect that genetics might provide scientific cures for some pressing social problems.

Human heredity presented special problems for the Mendelians. Generation times were long, accurate records poor, and matings impossible to arrange. Most of the early genetical analysis of human heredity therefore was directed toward distinct pathological characters such as albinism or alkaptonuria. Geneticists consciously decided to concentrate their efforts upon more tractable organisms because, as Edward Murray East at Harvard later said, "the laws ruling the inheritance of the denizens of the garden and the inmates of the stable were found to be applicable to prince and potentate as well" (East, 1923, p. vi).

The social problems associated with race differences and race crossing seemed obviously to have a strong genetic component. Thus problems associated with race inevitably attracted the attention of those geneticists interested in the social implications of their work. By the early 1920s, a clear consensus had emerged from these geneticists regarding the issues of race differences and race crossing.

With the rapidly increasing knowledge of heredity in general, and of the inheritance of abnormal traits in humans in particular, came the rise of the eugenics movement. Riding the crest of genetic discoveries, eugenists wished to apply the newfound knowledge to the genetical improvement of human populations. The possibilities for genetic improvement seemed both great and feasible. In addition to eliminating medical defects, many eugenists hoped to eliminate problems like criminality and feeblemindedness. In many

countries geneticists lent their prestige and support to the early eugenics movement. I will not here examine the eugenics movement or geneticists involvement in it because several excellent studies are readily available, the most recent being that of Kevles (1985). The eugenics movement is, however, the backdrop from which most geneticists spoke about race. Geneticists who wrote and lectured about race in the first quarter of the twentieth century generally treated it as a subdivision of their larger interest in the eugenic improvement of humans.

Again, I will emphasize that geneticists did not set the cultural tone for analysis of the issues involving race. For example, the great eleventh edition of the *Encyclopaedia Britannica* stated flatly that "Mentally the negro is inferior to the white," and only barely softened this statement by adding, "But though the mental inferiority of the negro to the white or yellow races is a fact, it has often been exaggerated; the negro is largely the creature of his environment" (Vol. 19, p. 344). Geneticists reflected this larger cultural view, but they also augmented it with their scientific justifications.

Charles Benedict Davenport

Davenport was the first American geneticist to devote his primary attention to human genetics. Although aware of the small amount of data available, he believed (along with most other geneticists) that the growing evidence from other animals could be meaningfully extended to humans. Beginning in 1907, Davenport and his wife Gertrude began publishing serious research on human heredity: on eye color (1907), hair form (1908), hair color (1909), and skin pigment (1910). Although many of the Davenports' genetic hypotheses were later modified by more exact research, the papers established them as major students of human heredity. Every contemporary genetics textbook cited these papers, including those published in England and Germany; the Davenports stood out in a field where little research was being conducted on the inheritance of normal characters in humans. Later historians have tended to condemn Davenport for sloppy and almost fraudulent research on human heredity, but they have not taken adequate account of these early papers or the high regard other geneticists held for them.

In 1911, Davenport published his book, *Heredity in Relation to Eugenics,* which contained almost all that was then known of human genetics. The purpose of the book was to interest educated lay persons in eugenics. Realizing that eugenics had to be founded upon exact knowledge of human heredity, Davenport attempted to convince the reader that geneticists knew a great deal about human heredity. He included every possible hereditary trait, with little critical distinction. Thus he presented albinism, alkaptonuria, musical ability, and feeblemindedness all as simple Mendelian recessives. Compelling genetic evidence for the first two was available, but not of course for the latter two. From the vantage point of modern human genetics, *Heredity in Relation to Eugenics* appears naive and overinflated; but in 1911 most geneticists found the book congenial even if they disagreed on particulars. Davenport was clearly the leading geneticist studying human heredity in the world at the time.

He was the first geneticist to publish extensively on race differences and race crossing. To understand Davenport's views on race it is necessary to first examine a crucial aspect of his general view of Mendelian heredity. He thought that Mendelian factors often controlled specific morphological or mental characters. Thus eye color was generally inherited independently of skin color in human crosses. In 1917 Davenport published a long article on the inheritance of stature in man, where he argued that many of the components of stature were inherited separately. For example, he thought an individual could inherit long arms from one parent and short legs from another. In the same year Davenport published a paper on human race crossing in which he argued that crossing between two distinct human races could be expected to yield disharmonious combinations of characters. Breeding a tall race with a short one could produce some children with "large frames and inadequate viscera" or "children of short stature with

too large circulatory apparatus" (Davenport, 1917, p. 366).

Perhaps more important in Davenport's view were the possible mental disharmonies that might arise from race crossing. He, like other geneticists, believed that races differed hereditarily in many mental characters, including intelligence, temperament, and emotions. And he also thought that the components of these aspects of mentality could be inherited separately. Thus he concluded that mental disharmonies as well as physical ones were to be expected in race crosses.

The color line

In 1918 the first edition of *Applied Eugenics* appeared. Written by Roswell Hill Johnson, who had studied under Davenport, and Paul Popenoe, the editor of *The Journal of Heredity,* this book would become the most widely used textbook on eugenics in America for more than two decades (a second edition appeared in 1933). The first six chapters outlined the current knowledge of heredity in humans (drawing of course from Davenport's book) and presented the argument for eugenic selection. The next fourteen chapters examined the practical means by which society could encourage eugenic selection with recommendations for social policy.

The inevitable chapter on race, entitled "The Color Line," argued that racial antipathy, visible wherever two distinct human races came into contact, was not simple bigotry but a hereditary behavior pattern evolved by natural selection as a mechanism protecting races from miscegenation. Popenoe and Johnson analyzed in particular the issues related to blacks and whites in America.

Negroes were inferior to whites, they argued. The evidence they cited for this assertion was that Negroes had made no original contribution to world civilization; they had never risen much above barbarism in Africa; they did little better when transplanted to Haiti; they had not achieved white standards in America; and their disease resistance was inferior to that of whites in America (although this situation was reversed in Africa). The new IQ tests revealed that Negroes scored significantly worse than whites. They concluded:

> From the foregoing different kinds of evidence, we feel justified in concluding that the Negro race differs greatly from the white race, mentally as well as physically, and that in many respects it may be said to be inferior, when tested by the requirements of modern civilization and progress, with particular reference to North America. (Popenoe and Johnson, 1918, pp. 291–292)

Popenoe and Johnson next turned to the question of race crossing between blacks and whites. Mulattoes, they claimed, were intermediate between the two parent races in color and intelligence; thus, "in general the white race loses and the Negro gains from miscegenation." For this reason they "unhesitatingly condemn miscegenation." But what of the argument that the surest way to elevate the Negro was through crossing with whites? They answered in Galtonian terms:

> To insure racial and social progress, nothing will take the place of leadership, of genius. A race of nothing but mediocrities will stand still, or very nearly so; but a race of mediocrities with a good supply of men of exceptional ability and energy at the top, will make progress in discovery, invention, and organization, which is generally recognized as progressive evolution.
>
> If the level of the white race be lowered, it will hurt that race and be of little help to the Negro. If the white race be kept at such a level that its productivity of men of talent will be at a maximum, everyone will progress; for the Negro benefits just as the white does from every forward step in science and art, in industry and politics. (Popenoe and Johnson, 1918, p. 293)

Here was Galton's conclusion again, but now supported by the data and wording of twentieth century genetics and quantitative psychology. Popenoe and Johnson ended their chapter on race with a strong exhortation for laws and taboos against intermarriage between blacks and whites: "Miscegenation can only lead to unhappiness under present social conditions and

must, we believe, under *any* social conditions be biologically wrong" (p. 297).

Popenoe and Johnson were not working geneticists but each had been the editor of *The Journal of Heredity* (for a short time they were joint editors), which published many articles by the leading geneticists. For example, Sewall Wright published there an outstanding series of eleven articles on color inheritance in mammals in 1917 and 1918. Popenoe and Johnson were very sensitive about being in touch with the views of geneticists.

For the purposes of this essay the most important aspect of *Applied Eugenics* is its reception by geneticists. So far as I can tell, geneticists welcomed the book. To my knowledge, no geneticist wrote a negative review of it. I spoke to Paul Popenoe on the telephone in 1971 and asked him about both the sources he and Johnson used to write the race chapter (he said that Johnson wrote the first draft of the chapter) and what reception geneticists gave the chapter. He said that they tried throughout the book to adhere to uncontroversial positions widely held by geneticists. In a written response to my question about the reception geneticists gave the chapter, he replied that he could "not recall that any geneticists disapproved of that chapter. It was definitely in line with the views of the majority, so far as I then knew" (Popenoe to Provine, 1971).

One might reasonably be tempted to dismiss Popenoe's evaluation as merely a self-serving historical veil. Actually, the contemporary evidence completely bears out his assessment. Not one geneticist publicly challenged the use of genetics to support the racial assessments or recommended policies. *Applied Eugenics* sold very well and went through several printings in the first edition and was used as the major textbook for eugenics courses at many universities, some of which were taught by geneticists. By contrast, the same ideas published in 1969 would certainly have been vigorously and justly attacked by leading geneticists.

Edward Murray East and the genetics of race

Although Popenoe and Johnson had both studied genetics, neither was a research geneticist. Davenport was respected by many of his colleagues and students but his work on human genetics was clearly tentative when compared to genetic research on more tractable organisms. Edward Murray East of Harvard's Bussey Institution, on the other hand, was deservedly one of the most highly respected research geneticists in the world. He also had greater influence than any other geneticist in America on issues of the implications of genetics for social and cultural policy from 1919 until the mid-1930s.

East began his academic career as an expert in corn breeding. His work on corn ranged from attempts to change the protein content to the study of multifactorial Mendelian inheritance. He was also a pioneer in the development of hybrid corn. After he came to Harvard in 1909, East became interested in the genetics of tobacco, and he became the world's expert on the inheritance of self-sterility alleles in that plant and in others. He had many distinguished graduate students at the Bussey Institution and was widely respected in the genetics community as one of the most careful and exacting geneticists anywhere. Thus when East began to write about the relation of genetics to social concerns, editors and publishers were eager to have his manuscripts and other geneticists read his publications.

During World War I, East worked seriously on the question of world agricultural planning for the United States government. He became intensely interested in questions related to the interaction of genetics and social policy and considered it his duty to speak out on the prospects and dangers that he saw on the horizon. For the rest of his life, East devoted much attention to the issues of overpopulation and what he viewed as eugenic decline. Race differences, race crossing, and social aspects of race relations, all socially volatile issues, naturally attracted his attention.

Immediately after the war, East and his former student, Donald F. Jones, published a technical book entitled *Inbreeding and Outbreeding* in the prestigious Lippincott biological monographs series edited by Jacques Loeb and Thomas Hunt Morgan. East did not let the opportunity to raise

social issues pass so easily—he added two chapters on humans and gave the book the extended title: *Inbreeding and Outbreeding: Their Genetic and Sociological Significance.* The book was an enormous success, required reading for all geneticists, and widely praised.

The final chapter was devoted entirely to discussion of race differences and race crossing. East chose this topic because "the world faces increasing amounts of race amalgamation, and there is naturally an acute interest in race problems" (East and Jones, 1919, p. 248) and because he believed that genetics could rationally be applied to the problems. From the genetics of other organisms, he deduced that human race crosses were likely to be of two types. Those between closely related races, such as the white races of Europe, could be expected to produce beneficial results. But East could see two possible genetical objections to wide human race crosses. First, Mendelian segregation would "break apart those compatible physical and mental qualities which have established a smoothly operating whole in each race by hundreds of generations of natural selection" (p. 253). Second, he thought that because race crosses generally produced intermediate physical and mental traits, the cross between blacks and whites should be avoided: "It seems an unnecessary accompaniment to humane treatment, an illogical extension of altruism . . . to seek to elevate the black race at the cost of lowering the white" (p. 254). East had no doubt that blacks were genetically mentally inferior to whites on the average. "In reality the negro is inferior to the white. This is not hypothesis or supposition; it is a crude statement of actual fact" (p. 253).

East's first objection to wide race crosses was that given by Davenport. The second was a direct reiteration of the objection raised most recently by Popenoe and Johnson, whose book East cited for evidence concerning the mental inferiority of blacks. Thus these objections to wide race crosses now had the clear approval of a top research geneticist who claimed that he was examining the issue objectively in accordance with known genetic facts, and East had established himself in the book as the world's expert on the biological facts of crossbreeding.

Geneticists reacted very favorably to *Inbreeding and Outbreeding.* Raymond Pearl, a prominent geneticist at Johns Hopkins University who in the 1920s was a strong opponent of the "Nordic enthusiasts" like Madison Grant and Lothropp Stoddard, reviewed the book for *Science* and heaped praise upon it, including the last two chapters, which must, he wrote, "fairly be regarded as among the sanest and most cogent arguments for the integral incorporation of eugenic ideas and ideals into the conduct of social and political affairs of life . . . . There is a refreshing absence of blind and blatant propaganda" (Pearl, 1920, p. 415).

After 1919, East published three books (East, 1923, 1927, 1931) and more than twenty articles on genetics and society. The first book, *Mankind at the Crossroads,* went through several large printings. Throughout all these publications, East maintained the same views about race differences and race crossing. In the period 1919 to 1935, he was certainly the most visible American geneticist writing about such issues and was considered by many intellectuals as the spokesman for the genetics community.

East was not a simple racist who argued that all blacks were mentally inferior to all whites. He was a population biologist, not a "typologist." East specifically ridiculed the biology of the popular racists such as Madison Grant, Seth Humphrey, and Lothropp Stoddard. Although these writers claimed to have based their assertions upon modern genetics, East denied this vehemently and classified them as "race dogmatists," whose belief that one race was completely superior to another was false biology. He sketched the difference between a biologist's point of view and that of a race dogmatist:

> The one forbids racial crossing because of an indefensible belief in the general superiority of all the individuals of one race over all the individuals of another; the other advises against racial crossing even between widely separated races of equal capacity simply because the operation of the heredity mechanism holds

> out only a negligible prospect of good results against a high probability of bad results through disturbing the balanced whole of each component. Both recognize differences in racial levels or averages, but the biologist realizes what an immense amount of overlapping there is. He sees how small is the gap between the efficiency levels of each race as a whole, and how great is the chasm between the superior and inferior extremes within the race, even though each race may have exclusive possession of certain hereditary units. (East, 1923, pp.131–132)

Furthermore, East was a staunch supporter of civil liberties for every individual. He was indignant about discrimination against blacks on trains and restaurants. He exclaimed that such discriminatory actions were "the gaucheries of a provincial people, on a par with the guffaws of a troop of yokels who see a well-dressed man for the first time" (East, 1927, p. 181). He clearly distinguished between biological equality and social equality under the law. But East, the population biologist who believed in civil rights for all, is the same person who concluded that "the negro as a whole is possessed of undesirable transmissible qualities both physical and mental, which seem to justify not only a line but a wide gulf to be fixed permanently between it and the white race" (East, 1923, p. 133).

Conclusion

In 1924 there could be little doubt in the minds of those who might be interested in what geneticists had to say about race differences and race crossing. From the published literature they could only conclude that geneticists possessed scientific evidence indicating strongly that human races differed hereditarily in intelligence and that wide human race crosses were dangerous at best, and probably should be avoided.

It is so easy from the current perspective to look back upon these geneticists, condemn them for their obvious racism, and brand their science as pseudo-science or worse. If they presented the same views today, we would be entirely justified in these assessments. But an objective historical perspective indicates that their views represented the mainstream rather than the fringe of geneticists, and that the great majority of geneticists believed, along with East and Davenport, that human races differed hereditarily in mentality. This conclusion was good science at the time, though not at the present.

GENETICISTS AND RACE, 1924–1939

In the mid-1920s Davenport and his associate Morris Steggerda conducted extensive research on blacks, whites and hybrids between them in Jamaica, examining physical characters and, using mental tests, intelligence (Davenport, 1928*a*, *b*; Davenport and Steggerda, 1929). In his report of this research to *Science*, Davenport stated that the evidence he had gathered in Jamaica was unequivocal in pointing to hereditary mental differences between blacks and whites: "We are driven to the conclusion that there is a constitutional, hereditary, genetical basis for the difference between the two races in mental tests. We have to conclude that there are racial differences in mental tests" (Davenport, 1928*b*, p. 628). They also concluded that the hybrids show both physical and mental disharmonies, but they admitted that their evidence was meager and that "the results merely propose an hypothesis and do not warrant a conclusion" (Davenport and Steggerda, 1929, p. 472).

The reaction of other geneticists to Davenport's conclusions is instructive. Many, like Herbert Spencer Jennings, a distinguished geneticist at Johns Hopkins University (and a former student of Davenport's), accepted Davenport's conclusions, as Jennings demonstrated in his book *The Biological Basis of Human Behavior* (1930). Others, led by William Castle of Harvard (also a former student of Davenport's), disagreed with Davenport's conclusions about the supposed disharmonies exhibited by the hybrids. Castle published in *Science* a strong and famous attack upon both Davenport and Jennings in 1930:

> We like to think of the Negro as an infe-

> rior. We like to think of Negro-white crosses as a degradation of the white race. We look for evidence in support of the idea and try to persuade ourselves that we have found it even when the resemblance is very slight. The honestly made records of Davenport and Steggerda tell a very different story about hybrid Jamaicans from that which Davenport and Jennings tell about them in broad sweeping statements. The former will never reach the ears of eugenics propagandists and Congressional committees; the latter will be with us as the bogey man of pure-race enthusiasts for the next hundred years. (Castle, 1930, p. 605)

Castle's *Science* article and this passage in particular has been hailed by Ashley Montagu and others as the precursor of the non-racist views that geneticists would express publicly only after Nazi atrocities were understood after World War II. Nothing Castle wrote has been so widely or favorably cited by other authors.

Just as in the case of East, however, historical perspective requires a rather different interpretation. Jennings had actually been a more vocal and activist opponent of the eugenists than had Castle. And Castle in 1924 had clearly stated that the white race had "less skin pigment and more intelligence" than blacks, and that mulattoes were intermediate in both characters (Castle, 1924, p. 366). East objected to black-white crosses on the grounds that the average intelligence of the whites would be reduced, resulting in fewer individuals of outstanding mental qualities. Castle agreed, but argued that this was a *social* rather than *biological* objection to wide race crosses, a characterization that East did not accept. Moreover, in the fourth edition of his widely used book, *Genetics and Eugenics,* published in the same year as his article in *Science* quoted above, Castle stated that "wide racial crosses among men seem on the whole undesirable" because the *particular combination* of characters found in each race would be broken apart (this passage had remained unchanged since the first edition in 1916: Castle, 1916, p. 233). Castle believed that the breaking-up of these particular combinations did not lead to disharmonious combinations, but the crosses might be opposed for social reasons. The real disagreement Castle had with Jennings and Davenport concerned their view of disharmonious race crossing, and Castle had evidence from rabbits that physical disharmonies simply did not occur in the way they had predicted. Castle agreed with them that blacks were, in a populational sense, mentally inferior to whites. (For a fascinating and somewhat different view of geneticists and race in the 1920s and 1930s see Glass, 1986.)

Castle's view that physical disharmonies were not to be expected from wide race crosses were borne out by Davenport's data and by a number of other studies of race crosses by geneticists and physical anthropologists. The most important of these were by L. C. Dunn and A. M. Tozzer (1928) on race crossing in Hawaii, by R. R. Gates (1928) on Amerindian crosses in Canada, by H. L. Shapiro (1929) on the descendants from the *Bounty* on Pitcairn Island, and by M. Herskovits (1928) on black-white crosses in the United States. There was, of course, still the possibility that more careful analyses, such as of fetal deaths or post-natal problems, might reveal problems with race crossing. Mental disharmonies and hormonal unbalances were also possible problems as Davenport frequently asserted. But the evidence for disharmonies from human race crossing was beginning to look very thin by the early 1930s.

By the late 1930s, the fear of disastrous physical disharmonies resulting from wide race crosses had almost disappeared among geneticists. Still, they worried that other disharmonies might arise. The German geneticist Fritz Lenz argued that crosses between Caucasians and Jews resulted in disharmonious mentality (Baur *et al.*, 1931). As geneticists became aware of Nazi race doctrines (which much resembled the simple-minded theories of Madison Grant and Lothropp Stoddard, whose works were translated into German), they reacted very negatively and published books and articles debunking Nazi race theories. Perhaps the two most significant examples were *We Europeans* (1936) by Julian Huxley and A.

C. Haddon and *Heredity and Politics* by J. B. S. Haldane. Although attacking Nazi race doctrines severely in these works, both Huxley and Haldane stopped short of denying that there might be hereditary mental differences between human races or that race mixture held no biological dangers. Haldane wrote:

> I would urge the extraordinary importance of a scientific study of the effects of racial crossing for the future of the British Commonwealth. Until such a study has been accomplished, and it is a study that will take generations to complete, we are not, I think, justified in any dogmatism as to the effect of racial crossing . . . . I am sure that the fact of our ignorance is a deplorable one which we ought to remedy. (Haldane, 1938, pp. 184–185)

And Huxley declared:

> In human genetics, the most important immediate problem is to my mind that of "race crossing." . . . The question whether certain race crosses produce "disharmonious" results needs more adequate exploration. Social implications must also be borne in mind in considering this subject. (Huxley, 1938*b*, p. 294)

East died in the same year as these quotes from Huxley and Haldane, and there remained no geneticist who continued the dire warnings about wide race crosses that he had sounded for more than fifteen years.

During the period 1924–1939, many geneticists kept the same attitude toward hereditary mental differences between races as had been expressed by East or Davenport. Thus in the first edition of his important textbook *Heredity,* A. Franklin Shull stated that "numerous studies, involving mental tests, school records, industrial success, and the like, agree in showing that the negro is mentally, at least, inferior to the whites" (Shull, 1926, p. 249). The same statement appeared unchanged in the third edition of 1938. Other geneticists' attitudes about hereditary mental differences between races, however, began to change, at least in emphasis, during the years 1924–1939. Before 1924 geneticists concluded from the *scientific* evidence that there were hereditary mental differences between races. Beginning in 1925, however, some geneticists began to argue that the scientific evidence was inconclusive. Among the first of these geneticists were Thomas Hunt Morgan (1925, pp. 205–207) and his former student Alexander Weinstein (1933). But the absence of positive evidence did not mean that geneticists believed there were no hereditary mental differences between races. They continued to believe that such differences did in fact exist but that the evidence was still forthcoming. This was very much like their attitude toward "genes" during the same period of time. Geneticists knew that the scientific evidence for material genes was inconclusive but they believed that future research would justify their belief in material genes; and of course this strong hunch later proved true.

By 1939, with the ugly consequences of Nazi race doctrines already beginning to be understood outside of Germany, most geneticists, even if they believed the scientific evidence for hereditary mental differences between races to be conclusive, did not say so in published documents. The prevailing attitude seen in print is well represented by the following two passages, one from Julian Huxley in England and the other from Samuel J. Holmes at the University of California at Berkeley. In his Galton Lecture of 1936 Huxley first pointed out the danger from unscientific theories of race differences: "The dangers of pseudo-science in these matters are being illustrated on a large scale, and with the accompaniment of much individual suffering and political danger, in present-day Germany. The Nazi racial theory is a mere rationalization of Germanic nationalism on the one hand and anti-Semitism on the other" (Huxley, 1938*a*, p. 17). Then he presented his views about race differences:

> Man as an animal organism is unique in several respects: and one of them is his abnormal range of genetic variability . . . .
>
> It would be most unlikely that this

> variability should be evenly distributed between different social and ethnic groups. As regards the latter, indeed, the existence of marked genetic differences in physical characters (as between yellow, black, white and brown) make it *prima facie* likely that differences in intelligence and temperament exist also. For instance, I regard it as wholly probable that true negroes have a somewhat lower average intelligence than the whites or yellows. But neither this nor any other eugenically significant point of racial difference has yet been scientifically established. (pp. 18–19).

Writing in *Science,* a very prestigious forum, Holmes reacted against the cultural anthropologists and others who, in the face of the Nazi specter, had begun to state publicly that modern science had proved the mental equality of human races:

> It has become the fashion to refer to race differences in mentality as if it were now demonstrated that no such differences exist, or, at least, that they are negligible in extent. In the light of our meager and unsatisfactory knowledge and the alternative possibilities of interpretation which existing data permit, this is, I think, a very unscientific position. (Holmes, 1939, p. 353)

The historical evidence is overwhelming that the great majority of geneticists before World War II continued to believe that races differed hereditarily in intelligence, and in particular that African blacks were in a populational sense less intelligent than whites.

Aftermath of Nazi atrocities: The UNESCO statements on race of 1950–1951

News of the Nazi atrocities repulsed people everywhere. No biologist wanted to give support to Nazi-like race doctrines, including assertions about hereditary mental inequality of races. After the war, only two geneticists, C. D. Darlington in England and R. R. Gates in the United States, made public statements indicating a belief in hereditary mental differences between human races, and both were dismissed as radical hereditarians by other geneticists at the time. Biologists and anthropologists published many books and papers attacking Nazi race theories and racism in general. The tone was completely different than before the war. Any possible differences between races in mentality were minimized. A. F. Shull, whose textbook before the war had stated flatly that "the negro is mentally, at least, inferior to the whites" revised this section in the fourth (1947) edition to read:

> The lack of any suitable measure (of race differences in mentality) is particularly evident when claims of the "superiority" or "inferiority" of any race are made. In such claims, some one has to decide how to balance, let us say, literary ability against artistic, scientific bent against philosophy. Races unquestionably differ in such matters, and perhaps at any particular time and place one type of ability would work out more advantageously than another. But such needs change more rapidly than races can change, so that even if "good" and "bad" could be correctly determined at any moment the judgement would not long remain correct. A still more serious fault of such decisions, however, lies in the plain fact that people who have made them in the past have expected to benefit economically from them. One can scarcely avoid the conclusion that estimates of racial worth are simply rationalization; some one is trying to brand as true that which he wishes were true, and acceptance of which as true would for the moment benefit him. (Shull, 1947, p. 276)

One would be hard-pressed to guess that this was written by the same person as the earlier statement. But it is important to notice in this passage that Shull did not retreat from the belief that races "unquestionably" differed in their hereditary mental capacities. His dilemma in writing about race in the light of the Nazi atrocities was to maintain his scientific beliefs while at the same time rejecting Nazi-like social action based upon the belief that races differed in mental capacity.

The dilemma between objective science and correct moral position on the question of race was particularly brought into focus by the debates surrounding the UNESCO Statements on Race in 1951 and 1952. The Preamble to the Constitution of UNESCO stated that

> the great and terrible war which has now ended was a war made possible by the denial of the democratic principles of the dignity, equality and mutual respect of men, and by the propagation, in their place, through ignorance and prejudice, of the doctrine of the inequality of men and races.

The mandate given to the Director General of UNESCO was to adopt "a program of disseminating scientific facts designed to remove what is generally known as racial prejudice" and "to study and collect scientific materials concerning questions of race . . . to give wide diffusion to the scientific information collected . . . to prepare an educational campaign based upon this information." In other words, UNESCO was supposed to fight racism worldwide by promulgating science and truth. It would not do for UNESCO to issue statements saying that scientists think that races differ hereditarily in mental capacities and therefore they should be treated equally. The dilemma was how to design the appropriate objective science to yield the desired moral conclusion.

In 1949 the Department of Social Sciences of UNESCO convened the first committee to draw up the first UNESCO Statement on Race. Several geneticists were invited but either declined or were unable to attend, leaving a committee of sociologists and cultural anthropologists. Led strongly by rapporteur M. F. Ashley Montagu, an anthropologist with a wide reputation as an opponent of racism, the committee drew up a document that appeared to serve the purposes of UNESCO. The statement as published and distributed worldwide contained the following assertions:

> For all practical purposes "race" is not so much a biological phenomenon as a social myth.
>
> The scientific evidence indicates that the range of mental capacities in all ethnic groups is much the same.
>
> There is no evidence that race mixture as such produces bad results from the biological point of view.
>
> Biological studies lend support to the ethic of universal brotherhood; for man is born with drives toward cooperation, and unless these drives are satisfied, men and nations alike fall ill.

The problem was that the science was supposed to be unassailable, but geneticists and physical anthropologists immediately attacked the statement vehemently. Their objections were all similar. They were amazed that no geneticists or even biologists were on the committee that drew up the statement; they were certain that there was some biological reality to human races; they suspected that races differed in some respects in mental characters; and they were appalled by the invocation of Prince Kropotkin's thesis of hereditary mutual cooperation applied to humans. Among the biologists who objected were L. C. Dunn, Theodosius Dobzhansky, Julian Huxley, H. J. Muller, and Curt Stern; the physical anthropologists were even more vociferously critical of the statement.

Since the whole rationale at UNESCO was to promulgate unassailable science in the fight against racism, the objections of major scientists constituted a severe blow to the credibility of the whole enterprise. Understandably, UNESCO decided to have a second statement, this time to be designed by geneticists and physical anthropologists. Accordingly, UNESCO convened a new committee in 1951 that included geneticists L. C. Dunn (rapporteur), J. B. S. Haldane, A. E. Mourant, and Hans Nachtscheim; Dobzhansky and Huxley contributed to the final wording. Montagu was the only holdover from the earlier committee.

In this statement, human races again existed as judiciously defined biological populations and there was no mention of

the inheritance of the cooperative instinct. But the crucial statements were little changed (for the complete UNESCO statement, see appendix 1):

> Available scientific knowledge provides no basis for believing that the groups of mankind differ in their innate capacity for intellectual and emotional development.
>
> There is no evidence that race mixture produces disadvantageous results from a biological point of view.

These statements conveyed the desired impression that biologists thought human races were alike in mentality and that race crossing produced no undesirable biological results; the conclusion was that all races should be treated equally.

But the statements were very carefully worded in the negative. The committee had not actually said that scientists thought there were no hereditary mental differences between races, only that there was no convincing scientific evidence that such differences existed. The committee was perfectly aware that there was also no scientific evidence that races had equal mental capacities. It was a tough problem to find the objective science that led directly to the proper moral conclusion on the race question.

The statement was sent out to 106 prominent geneticists and physical anthropologists for comment before publication (although the published statement was revised very little). Of these, 80 responded; 23 accepted the statement as a whole, including geneticists William Castle, Karl Sax, Jack Shultz, and L. H. Snyder; 26 agreed with the tenor of the statement but disagreed on particulars; and the others disagreed strongly with the statement. German geneticists and physical anthropologists (E. Fischer, F. Lenz, K. F. Saller, W. Scheidt, and H. Weinert) saw the statement as an attempt to combat anti-Semitism with a political statement based upon bad science and were all opposed to it. Greatest criticism was directed to the statement that "available scientific knowledge provides no basis for believing that the groups of mankind differ in their innate capacity for intellectual and emotional development." R. A. Fisher, K. Mather, A. H. Sturtevant, C. D. Darlington, W. Landauer, and H. J. Muller were among the geneticists who objected strongly to this statement. Fisher recommended revising the passage to read: "Available scientific knowledge provides a firm basis for believing that the groups of mankind differ in their innate capacity for intellectual and emotional development, seeing that such groups do differ undoubtedly in a very large number of their genes" (UNESCO 1953, 61).

Muller's comments were more representative of the most of the criticisms:

> I quite agree with the chief intention of the article as a whole, which, I take it, is to bring out the relative unimportance of such genetic mental differences between races as may exist, in contrast to the importance of the mental differences (between individuals as well as between nations) caused by tradition, training and other aspects of environment. However, in view of the admitted existence of some physically expressed hereditary differences of a conspicuous nature, between the averages or the medians of the races, it would be strange if there were not also some hereditary differences affecting the mental characteristics which develop in a given environment, between these averages of medians. At the same time, these mental differences might usually be unimportant in comparison with those between individuals of the same race. (UNESCO, 1953, pp. 48–49)

Muller added that

> it would . . . therefore be unfair for the committee to imply that the passage in question had the approval of geneticists. It happens that your committee has consulted a few geneticists who even though justly eminent, represent a much more extreme point of view on this matter than that prevalent among geneticists in gen-

> eral, or among geneticists who are regarded by their colleagues as having done outstanding work. Moreover, it is difficult for me to believe that most of even that group of geneticists which your committee has already consulted would concur in the particular passage under dispute if they were asked specifically about this point and had also read my protest concerning it. (p. 49)

The available historical evidence indicates that Muller's assessment in 1952 of his colleagues' attitudes about possible hereditary mental differences between races was entirely correct. That is, most of them still believed that races differed in hereditary mental characteristics, but that firm scientific proof was not yet available.

Now came the difficult question for Muller and the others who agreed with his criticisms so far. How were geneticists to use their scientific belief that races probably differed in hereditary mental capacities to conclude that all races should be treated equally in society and that race prejudice should be rooted out of society? Muller did not shrink from the issue:

> It would be a tragic mistake to suppose that the above realistic, scientific view leads to the conclusion that race prejudices are justified. It is highly important, especially at this crisis in the relations between peoples, for the committee to give the correct argument against these prejudices. The essential points are that the different racial groups (a) are enough alike genetically (b) are capable of being so much influenced in mental development by cultural and other environmental factors, and (c) contain such important individual genetic differences for psychological traits within each one of them, that all of them are capable of participating and cooperating fruitfully in modern civilization (as has also been empirically demonstrated). It also follows from this that all men should be given equal opportunities, equal civil rights, and the privilege of being judged and treated entirely as individuals without reference to their racial origin . . . .
>
> Undoubtedly the truth of the point of view above expressed will some time be generally recognized. It would be very unfortunate if in the meantime a statement had been drawn up by the committee which made the argument for fair treatment of one race by another depend upon the spurious notion that they are identical in the genetic basis of psychological traits. (UNESCO, 1953, pp. 50–51)

Now it should be immediately noted that it does not logically follow from Muller's a, b, and c alone that all humans should be given equal opportunities; another deeper, moral assumption is required.

In a personal letter to Dunn, his friend Walter Landauer addressed this issue:

> I fear my philosophy differs in one basic point. I *do* believe that the results of scientific investigation can greatly strengthen ethical judgments arrived at in some other fashion. I do *not* believe that ethical values can ever be derived from scientific data . . . .
>
> The UNESCO document was written on the assumption that from a certain body of scientific facts *necessarily* flowed certain ethical commandments. Perhaps because of this there was, I feel, some yielding to the temptation to treat *terra incognita* as *terra nullius.* It would surely make no difference to the ethical standards of the UNESCO group or to mine if, for instance, an unequal distribution of genes for certain mental traits were demonstrated. The declaration that all men are created equal was a fine one and remains so, even though and in the best sense *because* it is untrue in the biological sphere.

Dunn was much affected by this letter from Landauer and tried but failed to have UNESCO change the basic argument of the statement. He replied to Landauer:

> I agree with you now about the impossibility of deriving ethical judgments from scientific facts . . . in the final text we shall only refer to the inability of any scientific data about race to justify any limitation of the ethical principle of equality. I think you made a telling point

in considering equality a higher principle because untrue biologically.

Indeed, the published versions of both the 1950 and 1951 UNESCO Statements contained a caveat (this one from the second statement): "We wish to emphasize that equality of opportunity and equality under the law in no way depend, as ethical principles, upon the assertion that human beings are in fact equal in endowment." In other words, the committee covered its bases by saying that if the major argument in the statement failed, races still deserved equal treatment in society for moral reasons entirely unrelated to the scientific facts supposedly presented in the statement.

After the statement was published and distributed, Dunn wrote to the official at UNESCO in charge of producing the statement, giving his final assessment as rapporteur. The deepest problem with the whole enterprise, Dunn said, was that "an attempt was made to justify a particular ethical position on scientific grounds." By then, Dunn thought that the ethical position should be based upon moral grounds, with science merely an ally of secondary importance. Such a statement from UNESCO would have entirely undercut their original directive, which was to fight racism by the promulgation of nothing but objective science.

Dunn learned so much from the criticisms of UNESCO's second statement on race that he encouraged UNESCO to publish the criticisms along with the statement; the volume appeared in 1953, much to the credit of Dunn and UNESCO. This 94 page pamphlet is a major document in the development of geneticists' attitudes toward race differences and race crossing (UNESCO, 1953).

Conclusions

By the early 1950s geneticists had reached the following conclusions about race differences and race crossing:

1. Race mixture was biologically harmless. Further major research conducted by Newton Morton and his colleagues on first generation hybrids in Hawaii and a careful review of the literature through the middle 1960s revealed no significant effects of outcrossing upon birth weight, congenital malformation, and stillbirth or infant death (Morton *et al.*, 1967). Before the issue of race differences began to heat up again with the publication of Arthur Jensen's paper in 1969, the question of race crossing, a burning one for geneticists from 1900 through the 1940s, had ceased to be an issue for concern.

2. Most geneticists continued to believe that hereditary mental differences probably existed between human races, but they also, except for a relatively few like C. D. Darlington and R. A. Fisher, believed that scientific evidence for their belief was not conclusive.

3. Geneticists had begun to wrestle substantively with the extremely vexing issue of how to argue for equality in society for all races while holding open the possibility that there might be average differences in intelligence between races. They had not done very well on this issue in the creation of the second UNESCO statement on race.

THE GENETICS SOCIETY OF AMERICA STATEMENT ON HEREDITY, RACE, AND IQ

Twenty years after UNESCO published the deliberations of geneticists on the question of race differences, the Genetics Society of America, the largest and most prestigious society of geneticists in the world, became involved with the same issues.

Much had happened in the ensuing twenty years in the United States to change the cultural millieu in which the deliberations would take place. Among the more influential events were the desegregation decision in the case of Brown *vs.* Board of Education by the U.S. Supreme Court in 1954, the Montgomery bus boycott that signalled new vigor in the civil rights movement, the social unrest of the late 1960s often termed the "black revolution," and strong bids by native Americans, Hispanics, Asians, and other minority groups to take a greater share of the fruits of American culture. There was no time in the history of America when thoughtful citizens were less sympathetic to hereditarian

explanations for the differential success of racial groups.

Then in 1969 the Harvard Educational Review published Arthur Jensen's long paper, "How Much Can We Boost IQ and Scholastic Achievement?" His answer was "not much" because most of the variation of IQ in a population he thought was due to heredity. Although his estimate for the heritability of IQ was high, the thesis was hardly new and not intensely controversial beyond the field of educational psychology. But he also added a section applying the same argument to observed differences in IQ between blacks and whites. He concluded that it was a reasonable hypothesis that the IQ differences were caused primarily by genetic differences between the population of blacks and whites, a view he stated rather defensively:

> The fact that a reasonable hypothesis has not been rigorously proved does not mean that it should be summarily dismissed. It only means that we need more appropriate research for putting it to the test. I believe such definitive research is entirely possible but has not yet been done. So all we are left with are various lines of evidence, no one of which is definitive alone, but which, viewed all together, make it a not unreasonable hypothesis that genetic factors are strongly implicated in the average Negro-white intelligence difference. The preponderance of the evidence is, in my opinion, less consistent with a strictly environmental hypothesis than with a genetic hypothesis, which, of course, does not exclude the influence of environment or its interaction with genetic factors. (Jensen, 1969, p. 82)

By the standards of Darwin, Huxley, East, J. B. S. Haldane, Julian Huxley, H. J. Muller, A. H. Sturtevant, and indeed most geneticists who worked before 1953, Jensen's conclusion was less hereditarian than their own views, and not controversial. But this was no longer 1953. In the social realities of 1969, Jensen's conclusion was intensely controversial and it immediately raised a storm of protest. Geneticists, among the first being James F. Crow (1969), Richard C. Lewontin (1970), and Walter F. Bodmer and L. L. Cavalli-Sforza (1970) were involved heavily with the controversy.

The story of the Genetics Society of America "Resolution on Genetics, Race, and IQ" began at the 13th International Congress of Genetics held at Berkeley, California in August 1973. Interest in the issues of heredity, race, and IQ had exploded since the publication of Jensen's 1969 paper. Critics had carefully scrutinized and rejected many of Jensen's arguments, while far fewer supporters like Richard J. Herrnstein, William Schockley, and H. J. Eysenck had defended and expanded the hereditarian viewpoint. Jensen, of course, defended his own views with books, articles, and in public forums. In the same month as the meeting of the International Congress, he sent a notice to his friends and colleagues of three new books on genetics and education. Anti-Jensen feeling ran high in many academic circles and resolutions directed against his work were announced by such organizations as the Eastern Psychological Association, Society for the Psychological Study of Social Issues, American Anthropological Association, American Linguistics Society, and the American Sociological Association.

A small group of scientists and students at the University of California, Berkeley, calling itself the Committee on Genetics and Society (CGS), was strongly opposed to the new hereditarians. After sponsoring a very lively and well-attended informal session on genetics, race, and intelligence at the International Congress, members of CGS decided to distill the basic arguments against Jensen *et al.* into a brief document and resolution for action that they could submit at the Annual Business Meeting of the GSA (held in conjunction with the International Congress). They hoped that members of the GSA would approve their document and resolution and that the society could go on record as opposing the new hereditarians as had many other academic societies.

The document stated that a new revival of hereditarianism had occurred, with some proponents advocating school segregation

and sterilization of the "unfit." Such views, the document declared, had in the past led to the excesses of the eugenics movement. Following a brief refutation of the arguments of the new hereditarians came the following three part resolution:

1. We consider the conclusions of certain studies on intelligence and heredity, as currently exemplified by the work of Jensen, Herrnstein, Shockley, and Eysenck, to be scientifically invalid.
2. We oppose the use of these studies to provide genetic justification for class and racial discrimination.
3. We recognize our responsibility as geneticists to become informed about these issues and to speak out in our classes, at our professional societies, and in public arenas against this misuse of genetics.

At the Business Meeting, debate over the document and resolution was intense. Instead of adopting the CGS document and resolution, the membership present voted to appoint an *ad hoc* committee to draft a resolution on genetics, race, and intelligence. The resolution would then be sent to the membership in the form of a ballot, the results to be widely publicized.

The *ad hoc* committee was faced with the same difficult set of issues that earlier faced the geneticists who had drawn up and revised the second UNESCO Statement on Race: how could geneticists, with their unique understanding of the mechanisms of heredity in humans and other organisms, use their expertise to conclude that all racial groups of humans should be treated equally in society? UNESCO had proceeded upon the assumption that the correct science would lead directly to the correct moral conclusion. The basic problem with this approach, as Landauer and Dunn had discovered, was that geneticists seemed forced into advocacy of the view that all races had equal mental capacities in order to conclude that all races should be treated equally in society.

After wrestling with five draft versions over more than a year, the *ad hoc* committee of the GSA produced a version that was sent to the membership in January 1975. Prominently displayed in this document, the only passage printed in capital letters, was the following: "there is NO CONVINCING EVIDENCE OF GENETIC DIFFERENCE IN INTELLIGENCE BETWEEN RACES." Moreover, the final section on the role of geneticists contained this assertion: "It is our duty as geneticists to work to eliminate racial bias in educational opportunity by increasing public understanding of the relations between genetics, race, and intelligence." In other words, geneticists should promote the correct morality by presenting correct science to the public.

The citizen untrained in genetics would probably conclude from the document that geneticists believed a new eugenics movement fired by new hereditarians was upon us and that the new hereditarians were wrong. Geneticists, who ought to know, believed that no hereditary mental differences existed between human races, so all races should be treated equally.

Members of the GSA responded with enthusiasm for the document. Almost 90% of the 1,088 members responding wished to have their names associated with the document. Only 75 members disagreed and most of them were simply against the GSA taking any stand at all rather than disagreeing with the substance of the resolution. But the critiques that did arrive were telling.

The assertion about "no convincing evidence" came in for the most criticism. John A. Moore reflected the opinion of many critics:

> The punch line in the statement is really "there is no convincing evidence of genetic difference between races." If such a statement is read by a geneticist there is little problem but, of course, the statement is meant for a wider audience. For a wider audience, wouldn't it have been more useful—and truthful—to say "there is no convincing evidence of genetic difference between races and neither is there any convincing evidence that all races are equally intelligent." But if we settle for saying that is there any reason to say anything at all?

Only one letter in the entire set of responses addressed the question of the relation of science to morality in the resolution. This came from Norman Horowitz:

> The proposed statement is weak morally, for the following reason: Racists assert that blacks are genetically inferior in I.Q. and therefore need not be treated as equals. The proposed statement disputes the premise of this assertion, but not the logic of the conclusion. It does not perceive that the premise, while it may be mistaken, is not by itself racist; it is the conclusion drawn (wrongly) from it that is racist. Even if the premise were correct, the conclusion would not be justified . . . . Yet the proposed statement directs its main fire at the premise, and by so doing seems to accept the racist logic. It places itself in a morally vulnerable position, for if, at some future time, it is found that the premise is correct, then the whole GSA case collapses, together with its justification for equal opportunity.

Here was Landauer's position all over again.

In 1975 Oliver Smithies of the University of Wisconsin was President of the GSA. He faced a difficult choice. The membership of the GSA had overwhelmingly supported this resolution and its immediate release to the news media; but Smithies also thought some of the criticisms, especially that of Horowitz and those represented by Moore's letter, should be taken into account before the resolution was released. Smithies decided to block the publication of the resolution until he could present the issues to the membership at the next annual meeting of the GSA, scheduled for August 1975. Smithies and some of his colleagues at the University of Wisconsin then drew up a resolution of their own that they hoped the membership would substitute for the one produced by the *ad hoc* committee. Instead, at the meeting the membership rejected both the original *ad hoc* committee version and the new Wisconsin version and directed the *ad hoc* committee to produce a final version, taking into account all of the criticisms.

This version indeed incorporated the criticisms of Horowitz and Moore. It stated (for the complete GSA statement see Appendix 2):

> In our views, there is no convincing evidence as to whether there is or is not an appreciable genetic difference in intelligence between races.
>
> We deplore racism and discrimination, not because of any special expertise but because they are contrary to our respect for each human individual. Whether or not there are significant genetic inequalities in no way alters our ideal of political equality, nor justifies racism or discrimination in any form.

The membership responded even more favorably to this version than to the previous one: 1,488 members responded to the mailing (400 more than before) and 1,390 (94%) wished to have their names associated with the resolultion.

After two and one-half years of intense effort and much controversy, the GSA finally had a resolution on genetics, race, and intelligence that was ready for presentation to the public. Few geneticists, however, seemed terribly proud of the resolution. It was published in *Genetics* in late summer 1976 buried in the supplement, which contains business matters such as the budget, and which is bound separately from the scientific journal that geneticists actually read carefully. So far as I can determine, most members of the GSA never even knew that the resolution was published and certainly no attempt was made to widely publicize the resolution to the news media as originally intended. The only published reference to the resolution that I have ever seen was in a letter to the editor of *Science* in the issue of 7 January 1977. As a document of social significance, the GSA resolution was a failure. Yet as an objective statement of the current scientific understanding of genetics and race, its clear statement of ignorance is accurate. Also, the elevation of the moral principle of equality in society as a more fundamental guide to social policy than any objective scientific data on race differences in intel-

ligence reflects a more sophisticated conception of the complex relationship between science and morality.

Some geneticists in 1976 argued that there was no way to have a resolution that was both politically effective and scientifically accurate. John R. G. Turner (then of the State University of New York and now of the University of Leeds in England), a member of the *ad hoc* committee, wrote that "a scientifically accurate statement on this subject will be politically naive; a politically sound statement will be a scientific weasel. It will be hard to have it both ways."

I do not see why a statement by the most prestigious society of geneticists in the world could not be both politically effective and scientifically accurate. The statement that no one knows whether or not there are average mental differences between races is a clear rebuke to any hereditarians who claim to know that such differences do exist. The assertion that members of the GSA (including many Nobel Prize winners) are committed to the ideal of eliminating discrimination between races, sexes, or social classes and promoting equality of opportunity in society is not politically ineffective just because geneticists are unable to derive this position directly from their scientific knowledge of genetics. Andrei Sakharov did not have to pretend to derive his moral position on human rights from nuclear physics in order to have a significant political impact in the USSR. Nor do the prestigious scientists in Amnesty International feel they must deduce their views on human rights from their scientific expertise in order to be politically effective.

Loehlin, Lindzey, and Spuhler

During the same time that the GSA was debating its resolution on genetics, race, and I.Q., John C. Loehlin, Gardner Lindzey, and J. N. Spuhler were writing their book, *Race Differences in Intelligence,* which appeared in 1975. Prepared under the auspices of the Social Science Research Council's Committee on Biological Bases of Social Behavior and with an advisory board of prestigious scientists, this book was designed to be the objective scientific assessment of the question of race differences and intelligence. The authors embarked on the project in large part because the National Academy of Sciences had rejected the recommendation of one of its subcommittees to prepare an objective analysis of the question.

Their assessment of the evidence from a wide variety of research designs yielded the following conclusion:

> the studies we have reviewed in this chapter provide no unequivocal answer to the question of whether the differences in ability-test performance among U.S. racial-ethnic subpopulations do or do not have a substantial component reflecting genetic differences among the subpopulations. (Loehlin *et al.*, 1975, p. 133)

All the scientific evidence in the book corroborated this conclusion, which I consider to be an objective assessment of the evidence.

Their conclusions about the social and public-policy implications of the *possible* genetic differences between racial-ethnic groups in the U.S. were, however, far less objective.

> We consider it quite likely that *some* genes affecting *some* aspects of intellectual performance differ appreciably in frequency between U.S. racial-ethnic groups—leaving open the issue of which groups, which aspects, and which direction of difference. Thus we consider it most unwise to base public policy on the assumption that no such differences exist. If someone defends racial discrimination on the grounds of genetic differences between the races, it is far more prudent to attack the logic of his argument than to accept the argument and deny any differences. The latter stance can leave one in an extremely awkward position if such a difference is subsequently shown to exist. (p. 240)

The evidence presented in the book does not support the first sentence, although the authors are of course welcome to their speculations. More disturbing is their conclusion that it would be "most unwise to

base public policy on the assumption that no such differences exist." As the GSA resolution and the clear conclusions of Loehlin, Lindzey, and Spuhler indicate, there is no way the objective scientific ignorance of hereditary mental differences between races can be the guide to social policy. Here the guide must be moral views derived from the complex cultural web. A person fully cognizant of the current scientific results on race differences might reasonably assume (as a matter of social policy, not science) that no hereditary mental differences exist. Perhaps there would be some social costs; if so, they would probably be vastly less than the terrible social costs of hereditarian assumptions so prevalent in human history thus far.

Loehlin, Lindzey, and Spuhler also argue that some specified further research into hereditary mental differences between human races deserves "fairly high scientific and social priority" (p. 256). Given that all the research on this question up to 1975 left scientists in near total ignorance on the crucial question of hereditary mental differences between races and that the social control necessary to conduct the crucial experiments is deeply unethical in our society, one can understand why many geneticists disagree with the conclusion that further research in this area has a high priority. Bodmer and Cavalli-Sforza conclude:

> Since we believe that, for the present at least, no good case can be made for such studies on either scientific or practical grounds, we do not see any point in particularly encouraging the use of public funds for their support. There are many more useful biological problems for the scientist to attack. (Bodmer and Cavalli-Sforza, 1970, p. 29)

I have no evidence to say what proportions of geneticists now might support the view of Bodmer and Cavalli-Sforza or that of Loehlin, Lindzey, and Spuhler.

FINAL REMARK

Geneticists are generally more qualified than other members of society to assess the scientific evidence of hereditary mental differences between human races. They have made a significant contribution to the controversy by showing clearly how little we actually know about such issues. They are not, however, more qualified than other groups of thoughtful persons to set the social and cultural ideals relating to race relations.

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APPENDIX 1

UNESCO STATEMENT ON THE NATURE OF RACE AND RACE DIFFERENCES, 1951

Paris, June 1951

The reasons for convening a second meeting of experts to discuss the concept of race were chiefly these:

Race is a question of interest to many different kinds of people, not only to the public at large, but to sociologists, anthropologists and biologists, especially those dealing with problems of genetics. At the first discussion on the problem of race, it was chiefly sociologists who gave their opinions and framed the 'Statement on race'. That statement had a good effect, but it did not carry the authority of just those groups within whose special province fall the biological problems of race, namely the physical anthropologists and geneticists. Secondly, the first statement did not, in all its details, carry conviction of these groups and, because of this, it was not supported by many authorities in these two fields.

In general, the chief conclusions of the first statement were sustained, but with differences in emphasis and with some important deletions.

There was no delay or hesitation or lack of unanimity in reaching the primary conclusion that there were no scientific grounds whatever for the racialist position regarding purity of race and the hierarchy of inferior and superior races to which this leads.

We agreed that all races were mixed and that intraracial variability in most biological characters was as great as, if not greater than, interracial variability.

We agreed that races had reached their present states by the operation of evolutionary factors by which different proportions of similar hereditary elements (genes) had become characteristic of different, partially separated groups. The source of these elements seemed to all of us to be the variability which arises by random mutation, and the isolating factors bringing about racial differentiation by preventing intermingling of groups with different mutations, chiefly geographical for the main groups such as African, European and Asiatic.

Man, we recognized, is distinguished as much by his culture as by his biology, and it was clear to all of us that many of the factors leading to the formation of minor races of men have been cultural. Anything that tends to prevent free exchange of genes amongst groups is a potential race-making factor and these partial barriers may be religious, social and linguistic, as well as geographical.

We were careful to avoid dogmatic definitions of race, since, as a product of evolutionary factors, it is a dynamic rather than a static concept. We were equally careful to avoid saying that, because races were all variable and many of them graded into each other, therefore races did not exist. The physical anthro-

pologists and the man in the street both know that races exist; the former, from the scientifically recognizable and measurable congeries of traits which he uses in classifying the varieties of man; the latter from the immediate evidence of his senses when he sees an African, a European, an Asiatic and an American Indian together.

We had no difficulty in agreeing that no evidence of differences in innate mental ability between different racial groups has been adduced, but that here too intraracial variability is at least as great as interracial variability. We agreed that psychological traits could not be used in classifying races, nor could they serve as parts of racial descriptions.

We were fortunate in having as members of our conference several scientists who had made special studies of the results of intermarriage between members of different races. This meant that our conclusion that race mixture in general did not lead to disadvantageous results was based on actual experience as well as upon study of the literature. Many of our members thought it quite likely that hydridization of different races could lead to biologically advantageous results, although there was insufficient evidence to support any conclusion.

Since race, as a word, has become coloured by its misuse in connexion with national, linguistic and religious differences, and by its deliberate abuse by racialists, we tried to find a new word to express the same meaning of a biologically differentiated group. On this we did not succeed, but agreed to reserve race as the word to be used for anthropological classification of groups showing definite combinations of physical (including physiological) traits in characteristic proportions.

We also tried hard, but again we failed, to reach some general statement about the inborn nature of man with respect to his behaviour toward his fellows. It is obvious that members of a group show co-operative or associative behaviour towards each other, while members of different groups may show aggressive behaviour towards each other and both of these attitudes may occur within the same individual. We recognized that the understanding of the psychological origin of race prejudice was an important problem which called for further study.

Nevertheless, having regard to the limitations of our present knowledge, all of us believed that the biological differences found amongst human racial groups can in no case justify the views of racial inequality which have been based on ignorance and prejudice, and that all of the differences which we know can well be disregarded for all ethical human purposes.

L. C. Dunn (rapporteur), June 1951

1

Scientists are generally agreed that all men living today belong to a single species, *homo sapiens*, and are derived from a common stock, even though there is some dispute as to when and how different human groups diverged from this common stock.

The concept of race is unanimously regarded by anthropologists as a classificatory device providing a zoological frame within which the various groups of mankind may be arranged and by means of which studies of evolutionary processes can be facilitated. In its anthropological sense, the word 'race' should be reserved for groups of mankind possessing well-developed and primarily heritable physical differences from other groups. Many populations can be so classified but, because of the complexity of human history, there are also many populations which cannot easily be fitted into a racial classification.

2

Some of the physical differences between human groups are due to differences in hereditary constitution and some to differences in the environments in which they have been brought up. In most cases, both influences have been at work. The science of genetics suggests that the hereditary differences among populations of a single species are the results of the action of two sets of processes. On the one hand, the genetic composition of isolated populations is constantly but gradually being altered by natural selection and by occasional changes (mutations) in the material particles (genes) which control heredity. Populations are also affected by fortuitous changes in gene frequency and by marriage customs. On the other hand, crossing is constantly breaking down the differentiations so set up. The new mixed populations, in so far as they, in turn, become isolated, are subject to the same processes, and these may lead to further changes. Existing races are merely the result, considered at a particular moment in time, of the total effect of such processes on the human species. The hereditary characters to be used in the classification of human groups, the limits of their variation within these groups, and thus the extent of the classificatory sub-divisions adopted may legitimately differ according to the scientific purpose in view.

3

National, religious, geographical, linguistic and cultural groups do not necessarily coincide with racial groups; and the cultural traits of such groups have no demonstrated connexion with racial traits. Americans are not a race, nor are Frenchmen, nor Germans; nor *ipso facto* is any other national group. Moslems and Jews are no more races than are Roman Catholics and Protestants; nor are people who live in Iceland or Britain or India, or who speak English or any other language, or who are culturally Turkish or Chinese and the like, thereby describable as races. The use of the term 'race' in speaking of such groups may be a serious error, but it is one which is habitually committed.

4

Human races can be, and have been, classified in different ways by different anthropologists. Most of them agree in classifying the greater part of mankind into at least three large units, which may be called major groups (in French *grand-races* in German *Hauptrassen*). Such a classification does not depend on any single physical character, nor does for example, skin colour by itself necessarily distinguish one major group from another. Furthermore, so far as it has been pos-

sible to analyse them, the differences in physical structure which distinguish one major group from another give no support to popular notions of any general 'superiority' or 'inferiority' which are sometimes implied in referring to these groups.

Broadly speaking, individuals belonging to different major groups of mankind are distinguishable by virtue of their physical characters, but individual members, or small groups belonging to different races within the same major group are usually not so distinguishable. Even the major groups grade into each other, and the physical traits by which they and the races within them are characterized overlap considerably. With respect to most, if not all, measurable characters, the differences among individuals belonging to the same race are greater than the differences that occur between the observed averages for two or more races within the same major group.

5

Most anthropologists do not include mental characteristics in their classification of human races. Studies within a single race have shown that both innate capacity and environmental opportunity determine the results of tests of intelligence and temperament, though their relative importance is disputed.

When intelligence tests, even non-verbal, are made on a group of non-literate people, their scores are usually lower than those of more civilized people. It has been recorded that different groups of the same race occupying similarly high levels of civilization may yield considerable differences in intelligence tests. When, however, the two groups have been brought up from childhood in similar environments, the differences are usually very slight. Moreover, there is good evidence that, given similar opportunities, the average performance (that is to say, the performance of the individual who is representative because he is surpassed by as many as he surpasses), and the variation round it, do not differ appreciably from one race to another.

Even those psychologists who claim to have found the greatest differences in intelligence between groups of different racial origin and have contended that they are hereditary, always report that some members of the group of inferior performance surpass not merely the lowest ranking member of the superior group but also the average of its members. In any case, it has never been possible to separate members of two groups on the basis of mental capacity, as they can often be separated on a basis of religion, skin colour, hair form or language. It is possible, though not proved, that some types of innate capacity for intellectual and emotional responses are commoner in one human group than in another, but it is certain that, within a single group, innate capacities vary as much as, if not more than, they do between different groups.

The study of the heredity of psychological characteristics is beset with difficulties. We know that certain mental diseases and defects are transmitted from one generation to the next, but we are less familiar with the part played by heredity in the mental life of normal individuals. The normal individual, irrespective of race, is essentially educable. It follows that his intellectual and moral life is largely conditioned by his training and by his physical and social environment.

It often happens that a national group may appear to be characterized by particular psychological attributes. The superficial view would be that this is due to race. Scientifically, however, we realize that any common psychological attribute is more likely to be due to a common historical and social background, and that such attributes may obscure the fact that, within different populations consisting of many human types, one will find approximately the same range of temperament and intelligence.

6

The scientific material available to us at present does not justify the conclusion that inherited genetic differences are a major factor in producing the differences between the cultures and cultural achievements of different peoples or groups. It does indicate, on the contrary, that a major factor in explaining such differences is the cultural experience which each group has undergone.

7

There is no evidence for the existence of so-called 'pure' races. Skeletal remains provide the basis of our limited knowledge about earlier races. In regard to race mixture, the evidence points to the fact that human hybridization has been going on for an indefinite but considerable time. Indeed, one of the processes of race formation and race extinction or absorption is by means of hybridization between races. As there is no reliable evidence that disadvantageous effects are produced thereby, no biological justification exists for prohibiting intermarriage between persons of different races.

8

We now have to consider the bearing of these statements on the problem of human equality. We wish to emphasize that equality of opportunity and equality in law in no way depend, as ethical principles, upon the assertion that human beings are in fact equal in endowment.

9

We have thought it worth while to set out in a formal manner what is at present scientifically established concerning individual and group differences:

(a) In matters of race, the only characteristics which anthropologists have so far been able to use effectively as a basis for classification are physical (anatomical and physiological).
(b) Available scientific knowledge provides no basis for believing that the groups of mankind differ in their innate capacity for intellectual and emotional development.
(c) Some biological differences between human beings within a single race may be as great as, or greater than, the same biological differences between races.
(d) Vast social changes have occurred that have not been connected in any way with changes in racial type. Historical and sociological studies thus sup-

port the view that genetic differences are of little significance in determining the social and cultural differences between different groups of men.

(e) There is no evidence that race mixture produces disadvantageous results from a biological point of view. The social results of race mixture, whether for good or ill, can generally be traced to social factors.

Text drafted at Unesco House, Paris, on 8 June 1951 by:

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(From: UNESCO 1953:36–43.)

APPENDIX 2

GENETICS SOCIETY OF AMERICA

RESOLUTION ON GENETICS, RACE, AND INTELLIGENCE, 1976

Report of the ad hoc *committee*

The bases for intergroup net differences in intelligence quotients are of considerable concern to all citizens, and especially to educators, psychologists, geneticists, and makers of public policy. Geneticists, whose business specifically includes analysis of differences within and between populations, feel a special responsibility to "keep the record straight", and to work to prevent the adoption of unwise public policy based on unwarranted conclusions from inadequate data.

The Genetics Society has grappled with this problem since 1973. We do not feel it is correct to establish an official Genetics Society policy, since "truth cannot be dictated by vote." Instead, an *ad hoc* committee of GSA members, appointed by our 1973 President, Melvin Green, has worked to produce an accurate and reasonable resolution on genetics, race and intelligence, which a large proportion of members can support, and which we hope will be understood and utilized by the general public, including decision makers. The members of this committee, including Harrison Echols, James F. Crow (from September, 1975), Walter E. Nance, David R. Perkins (through August, 1975), Janice B. Spofford, John R. G. Turner, and Elizabeth S. Russell, Chairman, were willing to undertake their task because they felt that in cases where social justice and public policy are concerned, sins of omission may be worse than sins of commission. During the first 16 months of our labor we produced four successive versions of the proposed resolution, involving major input by all committee members, with considerable exchange (by letter and telephone) between members with different outlooks, and with increasing organization, conciseness, and cohesion. Near the end of 1974, President Bruce Wallace asked us to present, as part of the action during his term in office, our fifth version. A letter, including the statement, was sent to members in January 1975 inviting criticism and suggestions, as well as statement of approval or disapproval. Close to one-half (1099) of GSA members responded to this version, and almost 90% of those responding agreed with the substance of each of its four sections. However, eighty-five members also wrote serious letters, many of them challenging, all of them thought-provoking. Some of the letters were wholly supportive, many were generally favorable but suggested specific alterations, and many were sharply critical.

Our 1975 President, Oliver Smithies, was uncomfortable with the idea of publishing a resolution, however generally popular, to which significant objections had been raised. In a July 1975 letter to the membership, he proposed rediscussion of the resolution at the Society's Annual Business Meeting. I refer you to the minutes of that meeting, printed elsewhere in this Records issue of GENETICS, for an account of that lively session. Its net result in regard to the resolution on Genetics, Race and Intelligence was that of the *ad hoc* committee was sent "back to the drawing board" to prepare another version. The committee, assisted by Douglas Futuyma and Sewall Wright, met in Chicago on November 23, 1975, to produce the following resolution:

PREAMBLE: Recent years have seen a revival of concern about the relative importance of genes and environment in determining differences in intelligence among individuals, social classes, and races. The controversy and the extreme views expressed are not new. The excesses of the early eugenics movement show the pitfalls of naive hereditarian assumptions. Equally unsupportable is the doctrinaire environmentalism that denies any significant role of heredity in important human behavioral traits. Since even well-meant social policies may be harmful if based on error or inadequate knowledge,

we believe that the views of many geneticists should be considered in trying to resolve the current controversy.

STATEMENT OF GSA MEMBERS ON HEREDITY, RACE, AND IQ

Measurement of intelligence:

Because of their reproducibility and widespread use, IQ scores have been the basis for most analyses of genetic and environmental contributions to intelligence. Nevertheless, their limitations as measures of intelligence are widely recognized. Indeed, intelligence has never been defined to the satisfaction of all social scientists. The interpretation of IQ scores is especially troublesome when comparisons are made between different cultural groups. These limitations must be borne in mind in any genetic analysis.

Factors influencing IQ:

IQ scores are attempts to measure the quantitatively varying character of intelligence; such characters are usually influenced by both genetic and environmental factors whose effects and interactions are often difficult to separate unambiguously. Although there is substantial agreement that genetic factors are to some extent responsible for differences in IQ within populations, those who have carefully studied the question disagree on the relative magnitudes of genetic and environmental influences, and on how they interact. Moreover, in general, even if the variation in a trait is largely genetic, this does not mean that the degree of expression of that trait cannot be significantly altered by environmental manipulation. Nor does a large environmental component in variation necessarily imply that we can easily change it.

Racial and class differences in IQ:

It is particularly important to note that a genetic component for IQ score differences *within* a racial group does not necessarily imply the existence of a significant genetic component in IQ differences *between* racial groups; an average difference can be generated solely by differences in their environments. The distributions of IQ scores for populations of whites and of blacks show a great deal of overlap between the races, even in those studies showing differences in average values. Similar although less severe complexities arise in consideration of differences in IQ between social classes. It is quite clear that in our society environments of the rich and the poor and of the whites and the blacks, even where socioeconomic status appears to be similar, are considerably different. In our views, there is no convincing evidence as to whether there is or is not an appreciable genetic difference in intelligence between races.

IMPLICATIONS FOR SOCIETY

All human populations have a vast store of genes in common; yet within populations, individuals differ in genes affecting many characters. Each population contains individuals with abilities far above and below the average of the group. Social policies, including those affecting educational practice, should recognize human diversity by providing the maximum opportunity for all persons to realize their potential, not as members of races or classes but as individuals. We deplore racism and discrimination, not because of any special expertise but because they are contrary to our respect for each human individual. Whether or not there are significant genetic inequalities in no way alters our ideal of political equality, nor justifies racism or discrimination in any form.

THE ROLE OF GENETICISTS

Its our obligation as geneticists to speak out on the state of current knowledge on genetics, race, and intelligence. Although the application of the techniques of quantitative genetics to the analysis of human behavior is fraught with complications and potential biases, well-designed research on the genetic and environmental components of human psychological traits may yield valid and socially useful results, and should not be discouraged. We feel that geneticists can and must also speak out against the misuse of genetics for political purposes, and the drawing of social conclusions from inadequate data.

In January 1976, the GSA membership was polled to determine how many (and which) members wished to have their names associated with this revised resolution. As of April 19, 1976, responses had been received from 1,488, well over half of the total membership (approximately 2,600). Of those responding, 1,390 (94 percent) wished to have their names associated with the resolution. Another 69 would have preferred that members as a whole not take a stand, and 29 specifically did not wish to be associated with this particular statement.

We are, of course, gratified with this strong positive response, and hereby publish this resolution, which we hope is a reasonable, tempered summary of current knowledge (and lack thereof) relating to genetics, race and intelligence, not as an official pronouncement from the Genetics Society of America, but as a statement supported by 1488 geneticists whose signatures are currently on file in my office at the Jackson Laboratory.

Elizabeth S. Russell, *Chairman*
ad hoc Committee
President, Genetics Society of America 1976

(From Genetics 83:S99–S101; July 1976 Supplement.)