

## SCIENCE, RACISM AND IDEOLOGY

Steven Rose, John Hambley and Jeff Haywood<sup>1</sup>

FOR twenty years, from the 1940s to the late 1960s, scientific racism lay dormant; many believed it dead. The coffin of Nazi pseudogenetics had been well nailed down, the myths of the 1930s apparently destroyed and those who had helped push the corpse in and had mounted guard over it felt able to close down their picket line and go elsewhere. Within the last four years, the nails have burst, the coffin opened, and the revived monster, pausing only to change into modern dress, is bearing down on us again. Why has it happened? What is the socio-political context in which this particular ideological use of science has emerged? What are the scientific "facts" at issue? How can scientific racism be defeated?

In its modern form, the argument advanced by scientific racism claims to prove that certain groups, notably Blacks and working class, are less intelligent than others, notably White middle class, and that this difference is genetic—that is, inborn and therefore "biologically inevitable". In this article, we show that the basic question asked by scientific racism: "How much does heredity and how much does environment contribute to intelligence", is scientifically meaningless, but is part of an ideological battle which emerges at particular periods of social crisis.

### *The re-emergence of scientific racism*

In 1969 the *Harvard Educational Review* carried a long article by a relatively little-known educational psychologist from California, entitled "How much can we boost IQ and scholastic achievement?"<sup>2</sup> The author, Arthur Jensen, concluded that the reasons for the apparent failure of certain "compensatory education" programmes in the US lay, not in the inadequacies of the teaching itself, nor in the social structures which generate poverty in the US, but in the innate, genetic inferiority in intelligence of the groups concerned—mainly Blacks.

The article signified the start of this new round of the battle against scientific racism. It created an immediate furore. In the US, Jensen's lead was followed by a number of others, notably Richard Herrnstein<sup>3</sup> who extended the analysis to claim that most of the determinants of class differences in the US, seen as a broadly and increasingly meritocratic

society, were also due to genetic differences, and William Shockley (Nobel prizewinner in physics for work on the transistor) who derived the "logical" policy conclusions by noting that, as Blacks and White working class tend to have larger families than White middle class, it followed that the national intelligence was declining. Shockley's policy recommendation was for a programme of cash inducements for sterilization linked by a sliding scale to the sterilisee's IQ score.<sup>4</sup> When Jensen's work was cited by US segregationists in support of their school policy, he did not repudiate them.<sup>5</sup> When student protest mounted against the three men, the press claimed they were being martyred for their beliefs.

The issue was brought to Britain in 1970, when Jensen spoke at a meeting organized by the Society for Social Responsibility in Science at Cambridge.<sup>6</sup> Five opponents of his views also spoke and the press claimed the meeting had been stacked against him, that he was being persecuted for "heresy". The following year, a book endorsing Jensen's line and avowedly a "response" to the Cambridge meeting, *Race, Intelligence and Education*,<sup>7</sup> was written by Hans Eysenck, Professor of Psychology at the Maudsley Institute of Psychiatry in London, and a past teacher of Jensen.

The book was written for a popular audience; in his text, Eysenck first carefully disclaimed any racist intent, pointing to his own experience as a Jew in Nazi Germany; he then argued a detailed case in defence of the "Jensenite heresy" that Blacks (and Irish and working class) were genetically inferior in intelligence to White (and English and middle class). The book achieved considerable notoriety and triggered a number of replies.<sup>8</sup>

By this time, the controversy had long since ceased to be purely "academic". Eysenck was used to "explain" the high percentage of West Indian children in ESN schools and as a further justification for the educational premises of the authors of the so-called "Black Papers" which advocated a return to more selective education. To all the other arguments for racism in education, in the Trade Unions and elsewhere, could be added "but they're stupider—scientists have proved it". Yet there was further advantage to be obtained from the martyr stance. When Leeds University offered Shockley an honorary degree in 1973 for his transistor work, and then withdrew it when they were made aware of his more recent research proposals and policy recommendations, he was not slow to seize the publicity possibilities. Nor was Eysenck when, having been invited to speak at the L.S.E. by social science students, he was prevented from doing so and had his glasses broken in the ensuing mêlée. All he wanted, after all, as a Guardian leader put it, was some peace to "advance research in the field of genetics".<sup>9</sup> Facts, even unpalatable facts, must be faced; we must pursue scientific

truth with objectivity, wherever it may lead. The apotheosis of the "new Galileos",<sup>10</sup> brave and persecuted scientists, had come. No one bothered to point out that the ideas and research which Eysenck, Herrnstein, Jensen and Shockley were purveying, though trimmed out in modern style and appropriately sophisticated, were not new at all, but very old and long discredited.

*The historical roots of scientific racism*

The history of modern genetics dates from mid-19th century. Scientifically, it was, and is, concerned with such basic questions as: how does like beget like?—the similarity between individuals; and how do differences between individuals emerge? Intertwined in the questions of genetics are the questions of race and species. What distinguishes one species from another, and how did the different species evolve from common ancestors? Such questions have obvious connections with the human situation; and genetics grew contemporaneously with the full emergence of Victorian capitalism and, in particular with imperialism. From its beginning, there was a steady flow of concepts, models and terminology between the biological world of the geneticists and the human situation.<sup>11</sup>

Nowhere is this seen more clearly than in the case of Darwinian evolutionary theory, which drew on the idea of Malthus about human population to describe competition within biological species, but also found its own biological concepts pressed into service as social Darwinism, which took in distorted form such evolutionary slogans as "the struggle for existence" and "The survival of the fittest" and fitted them to *laissez-faire* Victorian capitalism.<sup>12</sup>

The middle class, the fittest, had a biological as well as a social right to their privilege, and intervention in this process by, for example, the State in education or protecting the health of the working class, was defying biology—going against nature. The middle class began to see the working class almost as a separate race—shorter and less healthy, with alien language and culture; a race born to *be* workers.

It was Charles Darwin's cousin Francis Galton who carried social Darwinism into the question of intelligence by way of his series of studies on the inheritance of talent, beginning with "*Hereditary Genius*" in 1869.<sup>13</sup> Galton studied the relations of a variety of eminent men (1 in 4,000 of the population of Victorian England, he estimated, fell into this category) and showed conclusively that judges, statesmen, divines, literary men, scientists, tended to have amongst their relatives, often stretching back through several generations, other judges, statesmen, etc. Here, Galton concluded, was incontrovertible proof that genius was inherited. Not for him to question seriously whether the possession of land, educational opportunity or belonging to an influential family

represented other predisposing factors towards eminence under the conditions of Victorian capitalism (it is not for nothing that Jensen refers in terms of admiration to Galton in his recent book).<sup>14</sup>

So far we have referred to the biological justification of class. But Galton explicitly introduces, and social Darwinism provides the ideological backdrop for, the biological justification of race as well, for the second half of the 19th century was of course that of the massive development of the practice and ideology of imperialism.

It was not difficult to see colonialism in pseudo-Darwinian categories; the peoples of other countries were different races, the biological imperative meant that races should struggle competitively to survive; the fittest won. As the English were the fittest, it was only natural that they should win, and their civilizing mission abroad was thus supported by a biological imperative; the colonized races 'were inferior in virtually every respect. The advantage of racism was that it transcended class. All the English—even the working class—were superior to and more intelligent than the "lesser breeds without the law", the wogs who began at Calais. Galton's work is unequivocal on this; it is full of such phrases as "from the highest Caucasian to the lowest savage. . . .<sup>15</sup> Here began the fatal conjunction whereby racism, by stressing one nation, the imperial country, against its colonies, has been able for so long to mystify and divide its working class to the continued benefit of its ruling class. It is of crucial importance to remember, therefore, that from its very inception in the 19th century, the technique of categorizing people according to their apparent biologically determined intelligence has been used as a method of justifying both the class structure and the racial discrimination of imperialist societies.

Galton was not merely the first to attempt to prove that genius was hereditary, that intelligence was genetically determined. His work predates the understanding of the biological basis of inheritance, which depends on the rediscovery of Mendel's work in the first years of this century, followed by the successive unfolding of the "biological revolution" which culminated in the 1950s in the recognition that the "double-helix" of DNA represented the genetic material. Galton was nonetheless able to devise an elaborate mathematical treatment to study the variability of particular "characters" (such as height, hair colour, intelligence, etc.), within the population. So convinced was he that most human qualities were inherited that he and his pupil Karl Pearson founded a new subject—later dignified by the name of science—eugenics—devoted to attempts to propagate a "healthier" race by using techniques comparable to those of the stockbreeder. In the name of eugenics, the middle class was to be encouraged to breed, to prevent being swamped by the working class, just as more than half a century later Vorster in South Africa urged the Whites to outbreed the Blacks.

The eugenicists applied themselves to protecting both the middle class from hereditary criminals, vice and political agitators, and the imperial countries (conceived of not merely as nation states, but as biological races) from inferior races. For Karl Pearson, "The path of progress is strewn with the wreck of nations; traces are everywhere to be seen of the head tombs of inferior races . . . the stepping stones on which mankind has risen to the higher intellectual and deeper emotional life of today".<sup>16</sup>

As eugenics crossed to the USA it became even more explicit. Of the US Blacks we find the eugenicist Holland claiming in 1883:

"Galton's law is squarely across their path, and the sooner they die gently out the better, and to assist them to multiply becomes as wrong as keeping the filthy and effete Turk in Europe for the sake of containing Russia. . . ."<sup>17</sup>

The tone of pious resignation, the regrettable acceptance of biological laws by hard-headed realists with the self-appointed task of biological law-enforcement, is almost precisely that of Jensen, Eysenck and Shockley in the 1970s.

### *Eugenics and Intelligence*

The early eugenicists talked of intelligence in very general terms of superiority and inferiority, as they had no means of quantifying it. The techniques for doing this were developed at the beginning of this century, notably by Binet in France and Burt in England. The quantitative measure that they developed, the Intelligence Quotient (IQ), was, in Binet's hands, originally intended as a way of classifying school children to provide special educational help for children who performed poorly. Unlike Binet, who condemned genetic "pessimism", Burt was a meritocrat; believing, as he continued to do until his death (1972) that most of intelligence was genetically determined and located in the middle class, nonetheless he could see that the distribution of intelligence must mean that there were a substantial number of working class children whom the system was excluding; the tests were a way of screening the working class, on a meritocratic basis, so as to select out that proportion and offer them the chance of a grammar school education.

We turn in the following sections to a more detailed critique of the tests and whether they actually measure anything other than performance on a certain set of socially-laden goals; for the moment it is necessary simply to note that the tests were instruments devised in a particular social context with the avowed intention, not of testing abstract scientific theory, but of stabilizing the social structure by acting as an instrument of social policy.

For Britain, the IQ tests served merely to "confirm" the Galtonian

hypothesis that the middle classes were superior, as, by and large, they scored higher than the working class; but they also showed the "potential" of many working class children to rise, for the overlap in scores between the two groups was considerable. As the biological inferiority of the Blacks was taken for granted and anyhow they didn't actually live here, it was at that point not necessary to direct the weapon of the I Q test towards them. The situation was very different in the United States, where the race issue was not separated by a strip of water and an imperial tradition, but was present, and increasingly so with the internal migration from South to North, in every state and city.

I Q testing was taken up with enthusiasm; a generation of child and educational psychologists modified and refined the techniques—and they were eugenicists almost to a man; from W. McDougall, who believed he had demonstrated racial inferiority in intelligence on the basis of differences in skull size; through G. S. Hall, exponent of the superior intelligence of the white races; James Cattell, key figure in the development of the Binet-Burt tests; to Terman, who made a life-long study of 'gifted children' and assumed that race lay, as a major determinant, beneath individual differences; and Thorndike, who encapsulated the ideology of capitalist psychology in one incomparable phrase: "In the actual race of life, which is not to get ahead, but to get ahead of somebody, the chief determining factor is heredity".<sup>18</sup>

Racist eugenics reached its climax in the 1920s and 1930s. On the one hand, there was the emergence of a nation whose social policy was explicitly committed to it; on the other, the depression and slump sharpened the arguments on the home front. Nazi ideology was explicitly racist, and called upon biology to justify German expansionism and the elimination of the Jews. And Nazi geneticists and anthropologists set about "proving" that the Aryans were indeed so biologically superior, on measures of physical and intellectual performance, to Blacks, Jews, gypsies or Slavs, as to constitute a new super-race against which the other groups represented mere "untermenschen"—undermen. As early as 1933 a Eugenic Sterilization Act was passed—merely a forerunner of the gas chambers. It was not merely the Nazi biologists who responded in this way. Two German physicists, both Nobel prizewinners, issued statements in the 1920s supporting the Nazi claims to Jewish genetic inferiority. The example of Philip Lenard and Johannes Stark<sup>19</sup> thus makes clear that William Shockley is not the first Nobel prizewinning physicist to propose biological cures for social problems.

Meanwhile, in Britain and the US, the eugenicists were quick to claim that the depression represented a symptom of national decline due to poor breeding. To the long list of categories for whom sterilization was proposed, already including mentally deficient and habitual criminals, was added the proposal to sterilize workers on the dole (of

course, Nazi Germany actually carried these policies into practice; "euthanasia" was applied to inmates of mental hospitals in parallel to the elimination of Jews and others in the concentration camps). The eugenicists pointed to the poor's large numbers of children, and concluded that the national intelligence was declining.

The challenge of Nazism domestically and internationally resulted in a mobilization not merely of the working class in Britain, but also of many scientists and other intellectuals, who saw that the cultural battle over genetics was part of the larger conflict with Nazism.<sup>20</sup> The fallacies and ideological role of Nazi pseudo-science were energetically exposed, and the bulk of the British scientific community rejected men like Lenard and Stark with contempt. The conflict of the 1939-45 war, which buried Hitler's thousand year Reich, submerged most of its racist biology as well, and the years of "end of empire" which followed 1945, with the emergence of many new African or Asian nation states, seemed to have completed the process. For a period at any rate, until the new relationships of economic neocolonialism could be established, most of the capitalist west was on the defensive against the new nations; expressions of a supremacist type were apt to be bad business and were frowned upon. Many believed the ideological battles of the 1930s were over. The atmosphere of the period is well summed up in the conclusion of a massive UNESCO study which concluded in 1951: "According to present knowledge, there is no proof that the groups of mankind differ in their innate mental characteristics, whether in respect of intelligence or temperament. The scientific evidence indicates that the ranges of mental capacities in all ethnic groups is much the same".<sup>21</sup>

It was this period of ideological truce which events of the 1960s were to shatter; a series of significant defeats for white imperialism of which the Vietnam war, with its racist overtones was but one; the sharpening conflict with neocolonialism, old fashioned colonialism and *apartheid* in Africa; the deepening race conflicts in the USA; and the quite new tensions created by the dependence of Western European capitalism through the 1960s on a massive influx of migrant workers; Turks and Yugoslavs into Switzerland and W. Germany, Algerians into France—and West Indians and Pakistanis into Britain. It is this combination of factors which has contributed to the re-emergence of scientific racism in its contemporary form.

### *Genetics and IQ; biology and social psychology*

The forms taken by the arguments advanced today by Eysenck, Jensen and others, differ little in their essentials from those we have discussed; true, they have been clothed in modern dress and are scientifically somewhat more subtle, but the intellectual origins are

clear to see, and we must now examine them in more depth. To do so, it is necessary to tease apart some of the strands which run through their approach.

(1) The first may be described as a general tendency to seek biological explanations for social issues, an appeal to the apparent scientificity of biological data which, although none of the men concerned is a biologist of any sort, is frequently used with debating skill to score points off non-biologically oriented educationalists or psychologists. This biological reductionism assumes that biological differences *cause* social differences.

(2) The second strand derives from the first: any aspect of human behaviour, they claim, must essentially be the result of two separable components, genetics and environment. Because these components may interact, a third term is therefore also introduced to account for this interaction.

(3) The last strand derives from the work of the educational psychologists; it maintains that the IQ score measures an isolable aspect of human behaviour, called intelligence. While there are difficulties in the construction of the IQ tests, the aim of this work is to measure pure, culture-free intelligence, known as "g" or "general intelligence".

When different racial groups and class groups are tested for IQ, there are differences in the average between the groups; thus American Blacks score on average 15 IQ points below American Whites. On the basis of the three strands in their argument, Eysenck and Jensen now ask the deceptively, fatally naïve question "What proportion of this difference is due to genetics and what to environment?" When they conclude that 80% is genetic, 20% environmental and virtually none due to an interaction between the two, and that this means that the difference in Black/White IQ scores is greater than can be accounted for by environmental factors, their syllogism is *complete*.<sup>22</sup> They can leave it to their followers like Shockley to draw conclusions about the decline in the national intelligence, the need for segregated schools, eugenic programmes and the like.

However, all three strands of their argument are confused, and contain fallacies embedded within them, making that apparently simple question a meaningless and hence pseudoscientific one. Let us see where the fallacies lie.

#### *Race and Biological Reductionism*

The theme of race and biological reductionism runs throughout the Eysenck/Jensen work. It leads them to maintain that if there is a biological and a social phenomenon which are correlated, the one *causes* the other—it is like saying that shortsightedness *causes* studiousness. In the lecture he was prevented from delivering at L.S.E., Eysenck

speaks of seeking for the "habitation" of intelligence within the brain<sup>23</sup> rather in the manner of a 19th-century phrenologist, and a similar "causal" chain of thought can be found in such statements as this of Jensen :

"The possibility of a biochemical connection between skin pigmentation and intelligence is not totally unlikely in view of the biochemical relation between melanins, which are responsible for pigmentation, and some of the neural transmitter substances in the brain. The skin and the cerebral cortex both arise from the ectoderm in the development of the embryo and share some of the same biochemical processes".<sup>24</sup>

Despite the cautionary tone in which this is worded, these sentences are either quite devoid of meaning, or they are making the extraordinary claim that can be paraphrased as "black skins may cause black brains".

But the most damaging form of this reductionism occurs in the use of the concept of race. There are two uses of the word race, one biological, the other social. The biological use of race refers to the relative discontinuities that occur in the distribution of a character within a species (e.g. *Homo sapiens*); usually these different groups come to exist by evolving in geographically separate areas; the process does not produce absolute differences, but a gene pool, separated from other such gene pools; as a result of this separation there evolve differences in gene frequencies between one race and another, though this need not be reflected in readily observable physical differences. By contrast, the social definition of race depends on social ascription, based on real or presumed cultural or physical differences; these differ from society to society and time to time, for example in the 1930s there was a vogue (now discredited) amongst eugenicists for a division of Europeans into three 'races', so-called "Nordic", "Alpine", and "Mediterranean"; today in South Africa, Japanese are classified as "honorary whites" whilst Chinese are "coloureds"; both the social characteristics ascribed to Jews and the legal definition of what constitutes a Jew has differed between, say Germany in the 1930s and Israel today.

What Eysenck and Jensen do is sometimes to use the biological and sometimes the social definitions with precision; at other times however, the two meanings are interwoven and used with dangerous and unscientific ambiguity. Thus, at times, when wanting to emphasize the biological respectability of his analysis, Jensen goes into great detail about population genetics within biologically defined races. But in going back to his raw data on educational performance, his categorizations are socially based. U.S. Blacks (with their estimated 25% of "White" genes) are defined socially, not in biological terms, so that a Black is one who is classed by the society in which he lives as Black,

just as in the apartheid situation of South Africa. At other times Jensen and Eysenck attempt to treat Mexican-Americans, Irish, Jews—and even the working class as a whole—as if these represented races in the biological sense—the only sense in which it is possible to study population genetics.<sup>14</sup> This biological reductionism is precisely, of course, that used by the Nazis and present day Fascist groups. The oscillation of Jensen's frames of reference between biological and social lead to ambiguity which makes suspect his special pleading for the "scientific" (and hence unchallengeable) basis of his analysis.

#### Genetics, development and the environment

The relationship between the genotype, the individual organism's inherited complement of genes (DNA) and the phenotype, the expression of the genes in the actual organism itself, is complex and generally oversimplified. We are often told that an individual's genotype determines his potential, which is modified by environmental factors. Thus an individual may grow to be 6 foot if fed well, only 5 foot 6 ins if undernourished as a child, but however well he is fed he will never grow taller than 6 foot—that is his genetic potential. Such a belief is a gross oversimplification of the actual situation because the definition of both phenotype and environment depends on the level of analysis used. The model reduces essentially to that of an empty vessel being filled to varying degrees during development, and of course it follows that once topped up, further filling is useless.

An organism begins at conception, at the combination of the genetic material from both parents and a small amount of egg nutrients. The genetic material consists of pairs of each of several thousands of genes, each of which carry the information to enable the cell to produce a particular protein. However, there may be several slightly different kinds of any given gene (alleles) produced by mutations, and every individual is unique in its particular combination of genes. The odds against identity—except for monozygotic (identical) twins who are both derived from a single fertilized egg—are billions to one. As the egg cell divides into many other cells their rate of growth is influenced by the environment in which they develop (e.g. the womb for humans or pond-water for frogs). Neighbouring cells produce chemicals which influence one another. Thus both the internal and external environment of the cell affects its genes. The result of this is specialization; cells which were equivalent become different; they become brain cells, liver cells or skin cells. All the cells of an organism are each other's environment; they influence and are influenced, while the amount and type of nutrients available influence them all. In addition, the organism as a whole has an environment. But this environment is not fixed; animals seek food, heat or visual stimulation—they modify their en-

vironment, and it in turn affects them. The process is a continuous, never-ending dialectic.

At the time of Galton and Pearson, a gene was an inferred, abstract concept; today however it has chemical meaning; each gene makes a single protein, which has specific tasks to perform within the economy of the cell. What is the relationship between such a gene and a "character" at the level of the organism? Sometimes it is relatively simple; eye or hair colour or blood group are determined by one or a few proteins. But how about behavioural characters like temperament or intelligence? Here the problem is much more complex because behavioural characters are measurements or abstractions from the properties of adapting organisms at a completely different level of organization from that of gene or protein. Their biological correlates must involve the interactions of tens of millions of cells, hundreds or thousands of different proteins. The dichotomous approach of contrasting genetic and environmental causes is biologically naive because it fails to take into account the obvious reality that we have, at any point in time, an organism reacting with its environment—not just a gene. Moreover the developmental dimension cannot be ignored, for it is in this context that we must assess the relationship between any gene or group of genes, to the organism and its external environment. This means we have to consider not only the response of genes to their environment but the contribution of early genetic events to the "environment" in which later genetic events occur.

Such a view does not ignore genetic variability; rather it embraces it. Certainly every person receives a unique constellation of genes at conception. But from that point onwards relatively few genes are active at any one time. The programme of switching genes on and off as development proceeds exhibits some paradoxical properties. Not only can the same group of genes in different environments result in different characters, but different groups of genes can, during development, result in the same character or structure being produced. This is because the biological machinery during development can adapt to certain contingencies and correct for them. However, overlaid on this capacity for self-regulation is the fact that there are critical periods throughout life during which the way in which the genetic programme responds to circumstances influences the patterns of response possible later in development. Examples include the fact that sex changes can be produced in the adult mammal, subverting its "genetic programme", by minute temporary changes in the hormone balance in the young animal during one such critical period. Indeed for a certain type of mosquito sex change can be produced merely by raising the temperatures at which it is reared! The normal range of variation seen in human populations is an outcome of the way unique genetic groupings develop

in their unique environments. Adaptability is a direct outcome of the interactions of genetic and environmental variability and it is because this is both stable in some senses but subject to limitations by environmental contingencies that we say biological mechanisms are dialectical rather than digital.

Thus structures or activities are not "in the genes". This is why the proposition advanced by Eysenck<sup>26</sup> that the Black population in the US may be stupider than the Black population of Africa because when the slavers came over Blacks with "high IQ genes" were able to escape, whilst the "low IQ" Blacks were caught, is biologically as well as sociologically fatuous. Incidentally, it is noteworthy that, faced with the fact that in Ireland the Irish population scores lower on I Q tests than does the English population in England (an intriguing example of the reductionist use of race, by the way!) Eysenck deploys the reverse argument—the high IQ Irish were the ones who emigrated to America, leaving the irredeemably benighted bog-peasants behind!<sup>27</sup>

There is no such thing as a "low IQ" or a "high IQ" gene—at best there may be particular combinations of genes which, in particular environments, produce "high" or "low" IQ. To take a simple example, there is a genetic disorder in humans known as phenylketonuria, a disease in which a particular substance, an amino acid, is utilized abnormally by the body. Phenylketonuric children are generally mentally defective. Hence the gene for phenylketonuria is a "low I Q gene". But if the phenylketonuric child is placed from birth on a diet in which the particular offending amino acid is absent, the child develops normally—in the different environment, the phenylketonuria gene is no longer a "low IQ" gene.<sup>28</sup>

The behavioural interactions during development in mammals show this dialectical phenomenon even in "normal" animals. Parents and offspring elicit and advance responses, and these are mutually modifying. Mice which have had their ear shape altered are treated differently to their siblings and, as a consequence, respond to their parents in a different manner.<sup>29</sup> Rats actively seek stimulating situations, they explore, and the results of deprivation or stimulation can be seen in various brain characteristics such as the amounts of important enzymes, or the degree of connectivity between brain cells.<sup>30</sup> The results of their earlier treatments can be seen in later behaviour. And how much richer than this is the human situation with its web of interactions and immense cultural variability. Within a given environment, an individual's behavioural patterns once established are fairly stable. The form that this stable structure takes is usually the result of a "choice" at some critical developmental period, when the pattern to be stabilized is determined.

Heritability, genetics and population *differences*

When pressed, adherents to the Eysenck/Jensen line would probably concede that for any individual, the question of the contribution of "genetics" and "environment" to a particular trait like intelligence is not meaningful. Instead, they fall back to the position that what cannot be measured for a particular individual can nonetheless be measured for a population, so that in a given population the contribution of genes and environment to the difference (called the variance) between individuals can be estimated. The variance describes the variability of the trait; the more alike the population, the lower the variance.

To deal with the complex interactions due to many genes contributing to a character the total variability is often crudely parcelled into two components, one readily attributable to environmental causes, and the remainder not.

The ratio of the apparently non-environmental variance (genetic variance) to the total variance is called the heritability. Heritability is a shorthand statement about the way the set of genotypes in a defined population tend to react in a defined environment. The heritability of a behavioural trait can, it is argued, be estimated from studies of individuals more or less closely genetically related. Thus identical (monozygotic) twins have an identical genotype, while non-identical (dizygotic) twins do not. Much of the data on the heritability of IQ is based on studies of the rather few cases of monozygotic twins reared apart, when the environment can be assumed to be different whilst the genotype remains fixed. It is primarily from this type of study that the heritability contribution to the variance in IQ in white populations has been calculated as 80%. Much of this data was collected by Burt, and is generally quoted without question. Yet a recent reassessment has cast very serious doubt on the validity of these studies and the 80% estimate derives from *them*.<sup>21</sup>

But there is a more substantial objection than merely questioning the figures. Note that even the "genetic variance" will include a certain amount of environmental influence because the environmental variance is defined essentially in social terms, ignoring the biochemical environment of which we spoke above, which in this calculation is parcelled into the apparently genetic variance. Thus the heritability calculation, *even applied to the population* from which the data was gathered, can not be used to set prescribed limits to genetic or environmental influence. It is a statement about tendencies, which can be and is useful in defined animal and plant breeding experiments, as a guide to how that population may respond to intense selection and/or environmental influences. But as a predictor beyond the bounds of that population at that time, it is of virtually no value. Although heritability calculations are useful

in the context of agriculture because the breeding of animals and plants can be precisely controlled, they are thus useless for the purposes to which scientific racists wish to put them.

But there is an even more fundamental flaw in the Eysenck/Jensen position than this. Heritability estimates are intended to measure the genetic contribution to the variance *within* a population—a biologically defined population with a freely intermixing gene pool. Measurement of how much the variance of a character is inherited *within* a population says nothing about the measure for the difference in that character *between* populations. Between two populations, the concept of the heritability of their difference is meaningless. The genetic basis of the difference between two populations bears no logical or empirical relation to the heritability within populations and cannot be inferred from it. There is an example given by Lewontin, which makes this clear.<sup>32</sup> Suppose, Lewontin says, one takes two batches from a sack containing seed from an open pollinated variety of corn with plenty of genetic variation in it, grows it in pots containing vermiculite, watered with a carefully made up nutrient, Knop's solution, used by plant physiologists for controlled growth experiments: "One batch of seed will be grown on complete Knop's solution, but the other will have the concentration of nitrates cut in half, and in addition, we will leave out the minute trace of zinc salt that is part of the necessary trace elements (30 parts per billion). After several weeks we will measure the plants. Now we will find variation within seed lots which is entirely genetical since no environmental variation within lots was allowed. Thus heritability will be 1.0. However, there will be a radical difference between seed lots which is ascribable entirely to the difference in nutrient levels. Thus, we have a case where heritability within populations is complete, yet the difference between populations is entirely environmental!

"But let us carry our experiment to the end. Suppose we do not know about the difference in the nutrient solutions because it was really the carelessness of our assistant that was involved. We call in a friend who is a very careful chemist and ask him to look into the matter for us. He analyses the nutrient solutions and discovers the obvious—only half as much nitrates in the case of the stunted plants. So we add the missing nitrates and do the experiment again. This time our second batch of plants will grow a little larger but not much, and we will conclude that the difference between the lots is genetic since equalizing the large difference in nitrate level had so little effect. But, of course, we would be wrong for it is the missing trace of zinc that is the real culprit. Finally, it should be pointed out that it took many years before the importance of minute trace elements in plant physiology was worked out because ordinary laboratory glassware will leach out enough of

many trace elements to let plants grow normally. Should educational psychologists study plant physiology?"

It follows that a prerequisite for any genetic study of the heritability of a trait between Blacks and Whites would be that Blacks and Whites lived in a homogeneous biological population—that they more or less randomly intermarried and brought up their children in a colour-blind society."<sup>11</sup>

The claim which Jensen makes, that some biological truth that "it is not unreasonable that genetic factors are strongly implicated in the average Negro-White intelligence difference"<sup>12</sup> has been uncovered, which he pits against a straw man position which he describes as "environmentalism". merely reveals a failure to understand what modern biology has to say about variability and genetics. In fact throughout the whole argument one is struck by the confusion under which Eysenck and Jensen labour; a confusion in which they seem to identify statistical procedures with genetic reality.

In the light of all this such statements about genetic limitations for certain populations are vacuous, naive and trivial despite their superficial scientific reasonableness. It is the use of the gene as a cipher, as a signpost of a fixed destiny, that highlights a Platonic archetypal approach to reality. A gene is not a cipher—it is part of a continuing process.

### *IQ and intelligence*

Although the demonstration of its genetic fallacies is enough in itself to destroy the basis for the Eysenck/Jensen case, it would be a mistake not to examine the third strand in the argument—that of the fixity of the IQ score, its relevance to intelligence and its biological "basis", and the difference in IQ scores between Blacks and Whites or working class and middle class.

The question of the validity of I Q tests as a measure of intelligence lies at the heart of the discussion of the differences in intelligence between races and social sub-groups. Certainly the proponents of the genetic basis of I Q seem to have little doubt; they often use the two terms interchangeably. There are several varieties of I Q test, all testing the ability to manipulate a combination of some or all of figures, numbers and words. Tests which rely on non-verbal skills and which present items not easily related to general knowledge are termed "culture-free" and in theory they should be equally difficult for any person, no matter what their background. In general IQ scores correlate very highly with scholastic achievements and their predictive value in this area is one use to which they have been put. Children have been screened for scholastic aptitude, segregated on the basis of this as measured by IQ and then given educations to fit their abilities. Because scholastic

achievement plays a large part in the choice of occupation, I Q scores inevitably have a reasonable correlation with socio-economic status. But are these tests, devised by those who have greatly succeeded in scholastic endeavours and which are used as part of the means of selecting their successors, measuring anything more than the ability to manipulate items under test conditions?

The I Q test is essentially a social construct, and is manipulated deliberately in order to provide a particular distribution of scores, such that when the percentage of the population at each I Q level is plotted out it forms what is called a "normal distribution" (Fig. 1). There

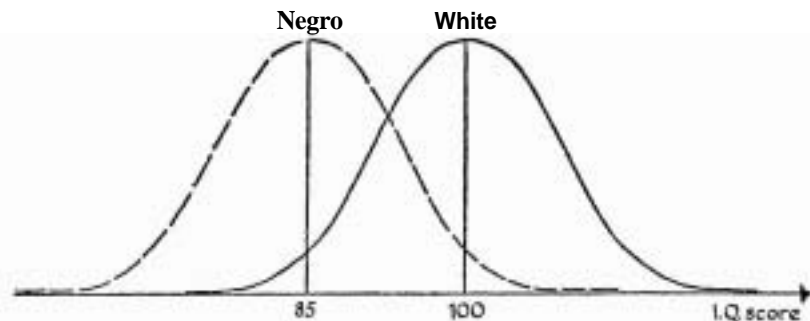


Fig. 1. Idealized diagram of distribution of I.Q. scores in U.S. white and black populations.

is a very small percentage at each of the extremes and increasingly more as the middle value (median), is approached, at which there is the highest percentage. The curve is symmetrical about the median, and is adjusted so that the median for the population—for instance, US Whites—is 100. When the same tests are then used for US Blacks, they average a score of 85. Because the IQ ranges of the two populations is wide there is considerable overlap; neither the data nor the theory state that all Blacks have a lower IQ than all Whites, but that, on a percentage basis, of the populations having high IQ values the ratio of Whites to Blacks will be high, and of those having low IQ values the ratio will be low.

The existence of a normal distribution of IQ is often taken to imply that it has a genetic base. This not only ignores the fact that the test is deliberately adjusted so as to produce a normal curve, and tests which do not produce such a curve are rejected, but it is also quite erroneous in genetic terms. Genes interact with each other in a variety of complex ways, and these interactions are different for different combinations of alleles. Unless the alleles, the frequencies with which they occur in the population and their interactions are known, and also the various

environments in which they developed, it is not possible to derive the distribution of the character in the population. There is no biological imperative which demands that a trait has a normal distribution. There are several known distributions for traits derived from many genes other than the normal curve.<sup>35</sup> It is another example of a reductionist belief that a statistical phenomenon implies a genetic mechanism. Yet the assumption that intelligence must be distributed normally in the population has a strong hold; a few are very clever, a few are very dull, most lie in neat ranks between. Tests are created to prove this; if most prove equal to a task then it is not a valid test, if most prove failures it is not a valid test; that test which gives a normal distribution must be the best.

Great play is made of the fact that there is considerable agreement between results obtained with different types of test. Yet this is scarcely surprising because tests are standardized against one another, and if they do not show concordance they are rejected. It is possible to devise tests in which Blacks or working class score higher than Whites or middle class. For instance, Blacks score better in some types of numerical tests.<sup>36</sup> The consequence is that the test tends to be labelled as "testing lower order skills". Black babies tend to be more advanced than White babies in terms of sensori-motor co-ordination,<sup>37</sup> and Eysenck and Jensen claim that this illustrates a so-called "biological law" that animals of lower final range of learning potential mature faster than those of a higher final range.<sup>38</sup>

The invalidity of this proposition is demonstrated clearly by comparison of two closely interrelated species, rat and guinea pig. The rat is born immature — blind, naked and with much of its brain development still to come. The guinea pig by comparison is much further developed at birth; its eyes are open, it has a coat of hair, can run well and its brain is much closer to the adult. Yet we may doubt whether even Eysenck and Jensen would wish to maintain that the rat has, in parallel to its relative prematurity, a substantially greater learning potential than the guinea pig.

Even so called "culture-free" IQ tests do not take into account the known effects of group differences in perception itself, both between geographically separated cultures (advanced urban industrial versus rural peasant) or between classes. An example is the study made by Lewis<sup>39</sup> who argued that working class children had to live in an environment in which they were subject to much more lies and misinformation ("noise") than the middle class. He devised tests in which the testee had to devise a strategy despite a great deal of such misinformation, and compared a group from a local working class cafe to a group from Mensa — the society for those with high IQs. The working class group did considerably better. What does this prove? Merely

that tests test what tests test. Standard IQ tests continue to test for performance regarded as compatible with the norms of our society.

Attempts to avoid the cultural problem in relation to Black/White differences include, for instance, doing IQ tests on Black and White groups matched for what is called "socio-economic status"—that is, groups doing roughly the same type of job, of the same age and educational background, etc. The differences in IQ persist and we are then told triumphantly that this *proves* the difference is biological. Yet surely to be part of a minority group in a majority culture which has enslaved your ancestors and discriminates against you on the grounds of your skin colour represents a cultural difference which cannot be equilibrated by crude manipulation of "socio-economic status"?

Yet another problem arises in the use of IQ tests, however, which springs from the actual test situation itself. Tests do not represent the application of a neutral instrument, a test, by an objective tester, to a testee whose performance is being measured. Rather the results of a test are themselves the products of three-way interaction between tester, test and testee. Whilst the contribution of the testee to this product is probably the most substantial, the other components of the interaction cannot be ignored. Such interactions manifest themselves at the level of labelling theory, in which, for example, teacher expectations of child performance may modify that performance, or in the reports that Black children may score better on IQ tests, administered by a Black (or even by a computer!) than by a White.<sup>40</sup>

Nonetheless, there is a persistent belief amongst the testers that IQ tests do measure real differences in an underlying biological character, intelligence. Hence, they claim, differences between rural and urban, Irish and English, working class and middle class, in test scores means not merely that the different groups score differently in a test which predicts social success within the context of a capitalist society, but that the scores are caused by innate biological differences.

Intelligence is seen as a relatively fixed attribute; an individual is not highly intelligent one moment and quite stupid the next (emotional vagaries aside) and as IQ scores remain relatively constant throughout a person's life, this is regarded as an indicator of the close connection between the two. Further assurance is provided by the fact that intensive training on the "better" IQ tests has been shown to have little effect on scores; only a small improvement can be achieved. But it is well worth emphasizing a crucial point which has been largely brushed aside by those wishing to prove a "genetic" theory. Although IQ in later life is relatively stable, it turns out that before the age of eight IQ scores are very variable and have a very low correlation with either IQ score or scholastic success in later life.<sup>41</sup> Furthermore, childhood is known to be a time during which many brain and behavioural devel-

opments occur. These changes occur in a defined sequence and are reflected in the ability to perform abstract tasks and conceptualization. Now even these tasks are the product of a similar ethos to that of IQ testing—the presentation of what appear to be problem situations to the developing child to test his ability to cope with them—but nevertheless they do demonstrate that many of the concepts needed for the performance of IQ-type manipulation are learned at a time in the child's life when IQ scores are far from fixed.

Despite all these doubts, some educational psychologists wish to claim that the IQ tests do indeed provide a measure of a biological characteristic, the so-called "general intelligence" or *g*, which underlies all tests. Some even go on to attempt to find a "habitation" for *g* in the brain, a neurophysiological homunculus, and to find "objective" measures, such as those of the evoked potential, measured as the "brain waves" of the electroencephalogram, for it. This is yet another example of crass reductionism, in this case apparently occasioned by two problems which beset the educational researcher. One is that of how to manipulate his complex analyses statistically; *g* is a property which emerges from multifactorial statistical treatment, and once again it turns out that a convenient statistical figment has become reified. A second problem is an apparent incapacity to look at what neurobiologists have been doing over the past decades in the field of learning theory. For the biologist, behavioural performance, even in animals, must be seen as the result of the interaction of a multitude of factors, including perception, motivation, attention, and arousal; in humans there may be other distinct factors.

To suggest that these combine to produce a single "general intelligence factor" is as ludicrous as to talk of "high IQ genes"—to go on from there to try to locate its "habitation" in the brain is, in terms of a scientific research programme, comparable to astrology or some of the wilder reaches of scientology. Unfortunately it has much greater social resonance than these follies.

#### *What does shape human performance?*

We have shown that the two major premises on which the Jensen/Eysenck position is based, one that behavioural differences between groups can be attributed a genetic component, and the other that IQ tests measure a fundamental biological attribute, are not merely fallacies but meaningless. *No type of scientific experiment could ever be designed to answer the question "how much does genetics and how much does environment contribute to the difference in intelligence between two racial or class groups?"*; it is like asking "which contributes most to the area of a square, length or breadth?" It is not a matter of leaving Eysenck in peace to "advance research in the field of genetics" as some would

claim (even were he a geneticist, which he is not). Because he is asking questions which are not scientific but pseudo-scientific, not objective but ideological, no amount of research within the framework imposed by these questions could ever yield "scientific" as opposed to ideological results. The whole edifice of genetically based Black/White or working class/middle class intelligence differences, with all their socio-political implications, comes tumbling down.

We are left then with IQ as a social construct, the symbol of a society which is determined to perpetuate class distinctions, where even the liberal hope of equality of educational opportunity is so far from reality as to raise no more than a hollow laugh. By and large, children's education in Britain has always been designed to fit them to their class destiny, with the bare minimums of mobility available to keep the pressure low and service technocratic needs. The disparities in the system are there in the primary schools, compounded in the streamed secondary schools or comprehensives with their appended depositories for the educationally subnormal<sup>G</sup> and capped by the superstructure of "higher" and "further" education. The structure is there with or without the IQ testers who descend upon it with their self-fulfilling prophesies to demonstrate its apparent biological inevitability.

But there are important things which biologists can say about behaviour and even intelligence, which are studiously ignored by Eysenck and Jensen, intent on grubbing through the discarded eugenics of the 1930s. There is a wealth of neurobiological evidence which reveals the way in which environmental factors, particularly during infancy, can effect not merely behaviour, but also the very structure of the brain itself. Such factors may be relatively crude, like malnutrition, or much more subtle, like the quality of the environment.<sup>44</sup> What this means is that, amongst the predictive factors for a child's subsequent performance at school are included family size, socio-economic status, mother's health during pregnancy and child's birth weight. Put more directly, the best way of ensuring that a child has a low IQ is to raise him or her in poverty, with inadequate food, poor health and bad home conditions. Where these conditions are improved, then school performance and "IQ" improve—as in the well-known comparison of two generations of 11 year old Aberdeen school children, on tests between 1932 and 1947.<sup>45</sup> Whereas the Eysenck/Shockley type model, that the national intelligence is declining, would have predicted a fall in IQ between the two generations, the actual results show a small increase.

Even the performance of individual children can be dramatically shifted by changing the environment. In the famous study by Skodak and Skeels<sup>46</sup> the IQs of a group of white children put into "high SES"

adopted homes, mostly before they were six months old, were compared to those of their (low IQ low SES) biological mothers. At age 13 or 14 the children showed an elevation of fully 20 points, from 85.5 average to 106 average. In another example, cited by Eysenck, Heber studied poor Black children with an expected IQ of 80, placed in a special school with a great deal of personal interaction with a trained social worker; the children's IQs, in Eysenck's own words "simply shot ahead" to "well above the 100 mark".<sup>47</sup>

The point is not that biological factors cause good or bad performance on IQ tests or other sorts of behavioural measure, or that intelligence is independent of a biological base, but that present day neurobiology is coming to understand that there is a continual interaction between the biology of the individual and his or her environment. Bad schools and an alienated society have biological as well as social consequences.

### Conclusions

We have tried to show that the scientific basis of Eysenck and Jensen's position is not what they claim. Their "evidence" says nothing about the question of genetic differences between populations, although this is cornerstone, the *raison d'être*, of their analysis. We are faced with a series of questions about human behavioural propensities; questions which raise issues about man's brain and its development. This is something we can say things about. In a sense the brain can be considered an ideological organ—it not only stores and enables the cultural transmission of our ideologies but its development and performance can be shown to be a function of the social context in which the individual develops.

This is true not only in the sense that the correlates of the unequal distribution and control of resources (e.g. malnutrition) can include deficits in growth and performance but also in the sense that the perceptual and cognitive performance of the brain will both respond to the world view of the society in which the individual grows up, and contribute to a world view. Inevitably the critique of Jensen and Eysenck must move on from an attack on their biological determinism to the impoverished world view that underlies, promotes and is the reason for their analysis.

It is time to return to our starting point. If their ideas are both old and scientifically discredited, why have they once again emerged from the cranky obscurity of the various eugenic and racial preservation societies, National Fronts, nordic leagues, empire loyalists and other racist or imperialist fringe groups?

The answers, interestingly, lie implicitly within the title of Arthur Jensen's original article. If we are really interested in boosting IQ and scholastic achievement, and all humans are the product of an interaction

of their genotype with their environment, we can in principle do one of two things: modify genotype or modify environment. No one knows biologically how to modify genotypes, or in what direction to do so, and the only sort of society in which such modification could be achieved would be a Nazi one--or a **Marcusan** situation of repressive tolerance coupled with cash incentives.

On the other hand we do know how to modify environments. We could do quite straightforward things, like eliminate malnutrition, poverty, slum schools and the self-fulfilling prophecies of teacher labelling of children for a start. We could go on to eliminate the environment which attempts to reduce not merely children but adults from thinking, creative humans to alienated "hands" divorced from all but the most routinized thought—the life experience of the vast majority of the population of Britain or the USA. The logical consequence of being in a society whose mode of production demands cultural and material alienation is precisely the diminution of the creative potential of the great majority of its members. Thus a prerequisite to answering Arthur Jensen's question, even if we do not regard his sort of scholastic achievement as our goal, is the transformation of the society in which we live. It is because of this that, at times such as the present, of acute internal contradictions within capitalism, issues of race and IQ come to perform a twofold ideological role.

On the one hand they provide an apparent "scientific" rationale for the existing social order. If we live in an hierarchical, alienated society, a society in which some are superior, others subordinate, this is portrayed as conforming to a "biological imperative". The distribution of the IQ score conveniently parallels the social order. The ideological role of this biological imperative is as manifest—though more sophisticated—as was the use of evolutionary theory in the nineteenth century, or their contemporary equivalents such as ecology (stop the lower orders breeding and the underdeveloped nations from developing, before a resource crisis overcomes the Western world) as in for instance, *Blueprint for Survival*<sup>48</sup> or some of the cruder forms of pop-ethology typified by Morris or Ardrey.<sup>49</sup>

At the same time the race/IQ issue performs another role in the service of capitalism—it is by its nature divisive; it sharpens not merely the class division of society, but also, within the working class, helps exploit the division between black and white. Where what is needed is the unity of the class in its common struggle, scientific racism, manipulated and exploited by the media, helps foster prejudice and tension within the class, sustaining racism even within the Trade Union and Labour movement. It is because their activities perform this particular ideological role that Eysenck and Jensen conform to Eldridge Cleaver's dictum that he who is not part of the solution is part of the problem.

But to say this is also to say that there is a solution as well as a problem. For just as human beings are not genetically programmed machines, or aggressively overcrowded rats, they are not condemned to exist in a class and race-bound capitalist order into the interminable future. What distinguishes humans from other animals is their social existence and their capacity under certain conditions to transform their own society and hence their own mode of existence. Rigidly defined categories such as I Q do not allow for the transformations of human consciousness which are produced in struggle and revolution—those creative turnings upside down of humanity's social environment. In the act of mobilizing against the ideological use of science in human oppression, we can help both to liberate ourselves and to transform the problem into its solution.

## REFERENCES AND NOTES

- The preparation of this article has benefited from extensive discussions with Hilary Rose and with Altheia Jones-Leconte and other members of the Brain Research Group at the Open University.
2. A. R. Jensen, *Harvard Ed. Rev.* 39 1 (1969).
  3. R. Herrnstein, *Atlantic*, 228, 53 (1971).
  4. W. Shockley, *Rev. Ed. Res.* 41 227 (1971).
  5. Jensen was challenged on this point at the Cambridge debate, July 1970, and did not deny it.  
Cambridge Society for Social Responsibility in Science; the debate is reprinted in: N. Chalmers, R. Crawley and S. Rose (eds.) *The Biological Bases of Behaviour*. p. 239, Harper and Row (1971).
  7. H. Eysenck, *Race, Intelligence and Education*, Temple Smith (1971).
  8. K. Richardson and D. Spears, (eds.) *Race, Culture and Intelligence*, Penguin (1972).
  9. *Guardian, Leader* (10 May, 1973).
  10. This phrase has been used both by the men themselves and others, e.g. A. Flew, *New Humanist*, (6July, 1973); *Guardian*, op. cit.; B. Barnes, in a 3rd programme talk with J. Ravetz (1972).  
H. Rose and S. Rose, in R. Whitley (ed.), *The Social Process of Science*. Routledge & Kegan Paul (1973). See also for a more extended treatment, H. Rose and S. Rose, *Ideology and the Natural Sciences*. Penguin, forthcoming.
  - R. Young, in W. Fuller (ed.) *The Social Impact of Modern Biology*. Routledge & Kegan Paul (1971).
  13. F. Galton, *Hereditary Genius*, Macmillan (1869).
  14. A. R. Jensen, *Educability and Group Differences*, Methuen (1973).
  15. F. Galton, op. cit., p. 22.
  16. K. Pearson, *Natural life from the Standpoint of Science*. p. 46, quoted by D. K. Pickens, *Eugenics and the Progressives*. Vanderbilt Press (1968).
  17. H. W. Holland, *The Atlantic Monthly*, LIII, 447 (1883), quoted in Pickens, op. cit.
  18. E. L. Thorndike, *Educational Psychology*, p. 308, quoted in Pickens, op. cit.
  19. J. Haberer, *Politics and the Community of Science*, Van Nostrand (1971).
  20. See e.g.: L. Hogben, *Science in Authority*, Unwin (1933); J. B. S. Haldane, *Hereditry and Politics*, Allan & Unwin (1938); J. Needham, *Time the Refreshing River*, Allen & Unwin, (1943). Or for a brief account H. Rose and S. Rose, *Science and*

- Society*, Penguin (1970), and in R. Miliband & J. Saville (eds.) *Socialist Register*, Merlin (1972).
21. Quoted in H. Eysenck, *Race, Intelligence and Education*, op. cit. See also UNESCO Courier, April 1965, p. 8.
  22. "The proportion of IQ variance accounted for by all these environmental factors combined was 18%, which agrees well with the figure of 80% for the influence of heredity; the two add up to just about 100%." H. Eysenck, *Race Intelligence and Education*, op. cit., p. 64.  
 "Those who call themselves 'interactionists' with the conviction that they have thereby either solved or risen above the whole issue of the relative contributions of heredity and environment to individual differences in intelligence, are apparently unaware that the preponderance of evidence indicates that the interaction variance,  $V_{ij}$ , is the smallest component of the total phenotypic variance of intelligence." A. R. Jensen, *Harvard Ed. Rev.*, op. cit., p. 39.
  23. H. Eysenck, circulated text of the lecture he was prevented from giving at L.S.E.
  24. A. R. Jensen, *Educability and Group Differences*, op. cit., pp. 226-7.
  25. Two examples of this oscillation, drawn more or less at random, are:
    - (a) "On tests of non-verbal intelligence, i.e. culture fair tests, Mexican-Americans are hardly inferior to whites; both groups are markedly superior to negroes. On verbal IQ and school achievement, Mexican-Americans are still superior to negroes, although inferior to whites. H. Eysenck, *Race, Intelligence and Education*, op. cit., p. 124.
    - (b) "The fact that very few people might suggest a genetic factor in the Jewish v. non-Jewish IQ difference (which averages about 8 to 10 points), however, does not make it an unreasonable hypothesis that genetic factors are involved in this subpopulation difference as well as in many others. The reason this particular question is not regarded as very important socially, educationally, or scientifically, is that no one believes that the Jewish minority as a group suffers any disadvantages due to an inability to compete intellectually, educationally, or occupationally in our society. Any social disadvantages that Jews may suffer as a result of their minority status is clearly not associated with their intelligence or educability, except possibly through the resentment of those who envy their conspicuous success in this realm. It is quite likely that genetic as well as cultural factors are involved in the average intellectual superiority of Jews, but in terms of social priorities it hardly seems a point worth researching. The same thing is probably true of the Oriental population of the United States as well." A. R. Jensen, *Educability and Group Differences*, op. cit., p. 60.
  26. "When we turn to intelligence, it may seem paradoxical that selection should ever favour the less intelligent, and consequently it may be difficult to reconcile the theories presented above with the possibility of any given racial group having lower genetic potential than others. *Yet it is easy to consider such possibilities.* If, for instance, the brighter members of the West African tribes which suffered the depredations of the slavers had managed to use their higher intelligence to escape, so that it was mostly the duller ones who got caught, then the gene pool of the slaves brought to America would have been depleted of many high IQ genes. Alternatively, many slaves appear to have been sold by their tribal chiefs; these chiefs might have got rid of their less intelligent followers. And as far as natural selection after shipment to America is concerned, it is quite possible that the more intelligent negroes would have contributed an undue proportion of 'uppity' slaves, as well as being much more likely to try and escape. The terrible fate of slaves falling into either of these categories is only too well known; white slavers wanted dull beasts of burden, ready to work themselves to death in the plantations, and under those conditions intelligence would have been

- counter-selective. *Thus there is every reason to expect* that the particular sub-sample of the negro race which is constituted of American negroes is not an unselected sample of negroes, but has been selected throughout history according to criteria which would put the highly intelligent at a disadvantage. The inevitable outcome of such selection would of course be the creation of a gene pool lacking some of the genes making for higher intelligence." H. Eysenck, *Race, Intelligence and Education*, op. cit., pp. 46-47 (our italics). But contrast this with "As it is, most of the experimental and statistical-observational work so far has been done by hereditarians, who have been much less prone to rely on non-empirical modes of proof." H. Eysenck, *Race, Intelligence and Education*, op. cit., p. 130.
27. "It is known that many other groups came to the USA due to pressures which made them very poor samples of the original populations; Italians, Spaniards and Portuguese, as well as Greeks, are examples where the less able, less intelligent were forced through circumstances to emigrate, and where their American progeny showed significantly lower IQs than would have been shown by a random sample of the original population. Other groups, like the Irish, probably showed the opposite tendency; it was the more intelligent members of these groups who emigrated to the USA, leaving their less intelligent brethren behind." H. Eysenck, *Race, Intelligence and Education*, op. cit., p. 47.
28. W. Bodmer, in K. Richardson and D. Spears, op. cit., p. 83.
29. S. A. Barnett and J. Burn, *Nature*, 213, 150 (1967).
30. A. Globus, M. R. Rosenzweig, E. L. Bennet & M. C. Diamond, *J. Comp. Physiol. Psychol.*, 82, 175 (1973).  
For review. see S. Scarr-Salapatek, *Science*, 174, 1223 and 1285 (1971); for a critique of Burt's data, L. J. Kamin, *Heredity, Intelligence, Politics & Psychology*, paper to Psychologists for Social Action, New York (1973) and In Press as a book.
32. R. Lewontin, *Bull. Atom. Sci.*, 26 (3) 2 (1970).
33. In his recent book *Education and Group Differences* (op. cit.) Jensen claims to have found a statistical manipulation by way of which he circumvents the between/within group problem. However such a manipulation scarcely touches the real issues involved; see e.g. De Fries, in L. Ehrman, G. Omann and E. Caspari (eds.) *Genetics, Environment and Behaviour*. Academic Press (1972).
34. A. R. Jensen, *Harvard Ed. Rev.*, op. cit., p. 82.
35. C. Stern, *Acta Genet. Stat. Med.* 4 (1953).
36. Quoted by L. Hogben, op. cit.
37. M. Geber & R. F. A. Dean, *Courrier* 6 (3) (1956).
38. A. R. Jensen, *Educability and Group Differences*, op. cit., p. 283.
39. B. Lewis, personal communication, and in *Sci. Rep. Systems Research* (1965).
40. P. Watson, in K. Richardson & D. Spears, op. cit. and D. F. Johnson & W. F. Mihal, *Proc. On-Line Conf.*, p. 49 (1972).
41. B. S. Bloom, *Stability and Change in Human Characteristics*. Wiley (1964).
42. J. Piaget, *Language and Thought of the Child*. Routledge & Kegan Paul (1959).
43. In Britain in 1973 there were 280,000 Black pupils, 200,000 of them children whose parents or grandparents were from the West Indies. Of this number, 300 were in grammar schools, 2,500 in ESN schools. 31% of ESN places in the ILEA area are filled by Black children, only 17% of normal school places. Even head teachers appear to believe that between 30 and 70% of these Black pupils are wrongly placed. (*Evening Standard*, 16 July, 1973).
44. J. Cravioto & E. R. de Licardie in N. S. Scrimshaw & J. E. Gordon *Malnutrition, Learning and Behaviour*. MIT Press, 1968. See also S. Rose, *The Conscious Brain*, Weidenfeld & Nicolson (1973).
45. Scottish Council for Research in Education, *Social Implications of the 1947 Scottish Mental Survey*. London U.P. (1953).
46. M. Skodak & H. M. Skeels, *J. Genet. Psychol.*, 75, 85, (1949); H. M. Skeels,

- R. Updegraff, B. L. Wellman & H. M. Williams, *Univ. Iowa Studies in Child Welfare*, 15, 10 (1938).
47. H. Eysenck, *Race Intelligence and Education*, op. cit., p. 133.
  48. E. Goldsmith, et al., *Blueprint for Survival*. Stacey (1972).
  49. For a discussion of these issues see S. Rose, *The Conscious Brain*, op. cit.; H. Rose & S. Rose in R. Whitley, op. cit.