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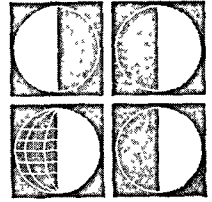
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Is Genetic Diversity Compatible With Human Equality?



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It is often alleged, even by some reputable scientists, that biology has demonstrated that people are born unequal. This is sheer confusion—biology has proven nothing of the sort. Indeed, every person is biologically, genetically, and therefore irrevocably *different* from every other. However, genetic diversity is not tantamount to inequality. And vice versa—equality of opportunity, or of status, or economic equality are not predicated either on genetic identity or on genetic diversity. Monozygotic twins, though genetically similar, may engage in different occupations and achieve unequal socioeconomic status. Human equality or inequality are not biological phenomena but sociological designs; genetic diversity is a biological reality. Equality before the law, political equality, or equality of opportunity, stem not from genes but from religious, ethical, or philosophical wisdom or unwisdom. Equality may be granted to all members of the species *Homo sapiens*, or only to some and withheld from other people, on the ground of some sensible or specious reasoning or caprice. By contrast, genetic diversity cannot be brushed away, even if this were desirable, which it is not.

Genetic diversity on the one hand, and

equality or inequality on the other, are independent in principle. And yet they are by no means mutually irrelevant. The rationale of human equality is not to make everybody physically or psychologically alike, or engaged in the same work or occupation. On the contrary, the purpose is to derive from the available diversity of humans the greatest possible benefits to the society, as well as to the individuals concerned. Plato in *The Republic* apprehended that, since different persons have different abilities, they achieve their own greatest well-being, and also make greatest contributions to the common good, when they develop their particular skills to the fullest extent. This simple truth has since been recognized by thinkers as diverse as J. S. Mill, Marx, Lenin, Mahatma Gandhi, and perhaps even Mao Tse Tung. But it raises a host of formidably difficult problems. Davis and Moore (1945, p. 124) speak of “the requirement faced by any society of placing and motivating individuals in the social structure. As a functioning mechanism a society must somehow distribute its members in social positions and induce them to perform the duties of these positions. It must thus concern itself with motivation at two different levels: to instill

in the proper individuals the desire to fill certain positions, and, once in these positions, the desire to perform the duties attached to them."

ENVIRONMENTALISM AND HEREDITARIANISM

The doctrine of environmentalism appeals strongly to many social scientists. Its extreme form is the myth of *tabula rasa*, the blank state. All human beings are deemed to possess the same potentialities at birth; they become different persons owing to varied upbringing and training, and generally to varied circumstances of their lives. If this were true, people would be interchangeable. When brought up in a certain way, any individual could be conditioned for any function or role in the social system. But even if everybody were born *tabulae rasae*, it would still be necessary to devise a great variety of conditioning programs à la B. F. Skinner, to manufacture the requisite motivations for different placements and socioeconomic functions. Individuals could, however, be chosen for different upbringing and training by means of a lottery or some equally arbitrary method.

The polar opposite of the *tabula rasa* myth is the myth of genetic predestination. Darlington (1969) has provided a modern version of this myth. To perform adequately the duties of any given social position, one has to be born with a special genetic endowment appropriate for that position. Traditional caste and rigid class societies attempted to organize themselves on the basis of the genetic predestination myth. A society was to be composed of genetically specialized populations and subpopulations. More than two millennia of caste system in India constitute the grandest genetic experiment ever performed with human materials. An attempt was made to transform the myth into reality. Bose (1951, p. 110) describes it as follows: "The careful way in

which the tradition of close correspondence between caste and occupation was built up is clear indication of what the leaders of Hindu society had in mind. They believed in the hereditary transmissibility of character, and thought it best to fix a man's occupation, as well as his status in life, by means of the family in which he had been born." The results of the Indian experiment should be studied carefully by geneticists, psychologists, and sociologists, but such studies are still waiting to be done. One does not know whether some average differences between the caste populations in cognitive or technical skills do or do not exist. But what is quite certain is that the experiment as a whole failed to achieve its purpose. No rigid genetic specialization for their traditional occupations has developed in Indian castes. A former "untouchable" is a cabinet minister in the government of India. Of course, genetic rationalizations of the caste and rigid class societies were (and still are) used more often by those who like to keep their privileges than by those really concerned about the welfare of their society.

Neither the *tabula rasa* nor the genetic predestination myths withstand critical examination. It is more and more widely recognized by those familiar with social biology that there are limits to interchangeability of people. Individuals with different genetic endowments often derive greatest satisfaction and are most effective in different occupations. This does not contradict the basic fact that the development of the human psyche is remarkably plastic. The plasticity is determined by the human genotype; it is a distinctive characteristic of the species *Homo sapiens*, being a product of unrelenting action of natural selection in human evolution, for perhaps two million or more years. Why has selection induced this plasticity? The human species is biologically unique, in that its adaptedness rests on the foundation of culture acquired

by every individual during his lifetime. Man is genetically adapted to live in environments created by culture, and he creates new environments for further adaptation. A "cultureless" human would not be merely a freak, he would not survive. Culture is not inborn, but the ability to acquire culture is genetic. Since culture is acquired by learning from other humans, the ability to learn is built into every non-pathological human genotype.

EQUALITY OF OPPORTUNITY AND MERITOCRACY

For at least several centuries, there has been a world-wide trend from rigid class societies to more and more open class structures. The changes are rapid in some societies and relatively slow in others; temporary setbacks have occurred in some places. The generality of the trend is nevertheless unmistakable. Emperor Nicholas I of Russia declared in 1827 "that nobody should aim to rise above that position in which it is his lot to remain." He was one of those who wished that social classes would stay fixed forever. Separate schools were established for children of the gentry, townspeople, and peasants. Policies of similar nature, though disguised in less brazen verbiage, were common in the more "advanced" countries of Western Europe. Although sympathizers with such policies are still not uncommon, even in allegedly "democratic" countries, only few governments dare to admit openly their existence. The apartheid policy in South Africa is a conspicuous exception. Anyway, a majority of people, in the realms of capitalist West as well as communist East, accept, at least in words though often not in deeds, equality of opportunity and meritocracy as commendable social arrangements.

Positions that persons obtain in a society under equality of opportunity are achieved through ability and willingness to exercise

it. With inequality, positions are ascribed rather than achieved. The ascription occurs on the basis of social class, family status, race, religious or professional affiliations of the parents, etc. Eckland (1967, p. 180) defines meritocracy as "a society in which positions are allocated on the basis of 'talent' (plus 'effort') rather than class or social advantage." Meritocracy and equality of opportunity usually go together, since the former is almost necessarily the outcome of the latter.

There are various degrees of equality or inequality of opportunity and of meritocracy. The traditional caste societies of India rejected equality between castes, but could hardly deny it to persons of the same caste. Somewhat less rigid were the feudal societies of Europe and closed privileged classes of more recent vintages. They did their best to discourage social mobility but could not prevent it altogether. Successful warriors, competent or adroit officials, paramours, sycophants, and others who knew how to please their superiors moved upwards. In a generation or two their offspring became proud bearers of aristocratic "traditions" and guardians of purity of aristocrat "blood." With the growth of capitalism, accumulation or loss of wealth became powerful forces of social mobility and of gene flow between would-be closed classes.

It is difficult to decide which of our contemporary societies are closest to the ideal of equality, because this ideal is more often accepted in theory than realized in practice. Examples of such divergence of theory and practice are not lacking in the United States. And yet, equality has undeniably gained ground, even within living memory of those now old or middle-aged. Take educational opportunity as an example: about 50% of 14-17 years olds in the United States were attending high schools in 1930, compared to 90% or more in the 1960's. In 1910 only 5% of youth aged

18–21 were in college, compared to about 40% in the 1960's. The U.S.S.R. reduced illiteracy from 70% in 1920 to about 2% in 1960 and decreed ten years of obligatory schooling for children and youths. It is nevertheless hard to tell whether equality of opportunity is on the whole greater in the U.S.S.R. and its orbit than in the United States. How things stand in China is quite obscure. The situation is quite variable in the so-called Third World. For example, in Indonesia only about half of the children ever go to any school, and less than 20% complete elementary schooling.

Social, economic, and political changes often have genetic consequences. Social scientists, not to speak of politicians, are rarely aware of the feedback relationships between biology and sociology and politics. It behooves social biologists and behavior geneticists to help supply such awareness. It is a fair statement that whenever a character variable in human populations has been at all adequately studied, genetic as well as environmental components in its variability have been brought to light. This applies to characteristics of all sorts—physical, physiological, and psychological—from skin color, stature, and weight, to intelligence, special abilities, and even to smoking habits. Of course, the relative magnitudes of the genetic and environmental components are vastly different for different characteristics. The manifestation of blood types depends relatively little on the environment, while scholastic achievement or musical ability are so obviously dependent on the environment that the involvement of genetic conditioning in the development of these characteristics continues to be the subject of inconclusive debate.

The statement that there is a genetic component in the variability of a given trait does not always mean that the mode of its inheritance is understood. A trait that “runs

in families” may be palpably genetically conditioned, and yet it is often unknown whether that trait is monogenic or polygenic, dominant, recessive or intermediate, let alone what its heritability may be in different environments and different populations. Take, for example, the genetic conditioning of criminality. The very suggestion that genes have anything to do with crime is abhorrent to many people. This is because of a miscomprehension. Genetic conditioning of criminality does not mean that the sole way to avoid being a criminal is to be born free of “criminal” genes. Nor does it mean that the carriers of some genotypes are fated to be criminals. It is possible, and indeed probable, that those branded criminals in our society would be law-abiding citizens, perhaps even admired leaders, in other societies. In some primitive tribes (though not in others), pugnacious and aggressive individuals may be regarded heroes; elsewhere they will perhaps be successful military commanders; but in a peaceable society they would be only debauchees or malefactors. Anyway, those who utter locutions like “inheritance of criminality” are not necessarily believers in genetic predestination. Inheritance of criminality may signify nothing more than that in any given environment, people with similar or identical genotypes will behave more similarly on the average than will people with diverse genotypes.

At this point, I shall make an assumption involving a frank value judgment. A society benefits from the fullest development of genetically conditioned and socially useful talents and abilities of its members. How can this salutary goal be achieved? In Aldous Huxley's “Brave New World” anti-utopia it was achieved by breeding genetically specialized varieties of humans, as well as by appropriate management of their development. Caste and rigid class societies attempted something in principle not too

dissimilar. They relied on aristocracies and craftsmen clans, rather than on meritocracies. They failed more or less dismally. The reasons why they failed are fairly obvious. Genetic talents of all kinds are dispersed throughout the social structure, in all strata of the social pyramid. Without equality of opportunity many, perhaps most of these talents, remain unutilized. This is true even if the incidence of some abilities and talents would happen to be greater in some socioeconomic classes or races than in others. The evidence for the above statement comes, among other sources, from the destruction of old elites during various revolutionary upheavals (e.g., in Russia). What was feared to be an intellectual decapitation did not result in any permanent genetic impoverishment. New elites were promptly recruited from the formerly undeveloped masses.

The way to make use to the fullest extent of the available pool of genetic talents and abilities is acceptance of meritocracy and equality of opportunity. Anybody should be entitled to aspire to any position or role in the society. Obviously not everybody will realize his aspirations. The realization will depend, among other things, on the genetic endowments of the aspirants. These "other things" are luck and willingness to work and exert efforts in pursuit of the chosen goal. The willingness may have some genetic component as well. Ideally, every person would elect the occupation or career for which she or he is most qualified genetically. The ideal is far from always realized, but mistakes are correctable if discovered early enough. It is silly for a tone-deaf person to wish to become a professional musician or composer. Some otherwise bright people do not easily master mathematics. A shorty is unlikely to excel in basketball, and a fatty in sports where speed is essential. However, making head-

way in the process of training or work is a source of pleasure, and nonsuccess of displeasure. Given anything like equal opportunity, relatively more people will become located in occupations that suit them than they would if the opportunity is restricted or denied.

To evaluate people according to any single scale of abilities, be that their IQ's or anything else, is grossly misleading. Human abilities are not unidimensional but multidimensional. An outstanding talent in some sphere may go together with a surprising incapacity in other respects. Is it really necessary that a boxing champion or a baseball hero achieve high grades in "academic" subjects in school? Or is a powerful musculature and splendid muscular coordination essential for college preparation or for an academic career? It would be interesting to assemble data on IQ scores of high achievers in occupations that do not obviously require high marks in general school and college training. I know of no such data. Anyway, it is probably safe to say that a musical virtuoso need not be a proficient boxer or vice versa, and a poet need not be a mathematician or vice versa. Success and excellence can be and in fact are achieved in different ways. However, equality of opportunity should maximize the probability that persons with pronounced abilities of different kinds will become located in their preferred and preferable niches in the social edifice.

APTITUDE AGGREGATIONS

Equality of opportunity, or simply equality, has been the watchword of those who championed human dignity and justice. This has been true at least since the Age of Enlightenment and the American Declaration of Independence, although the basic idea of human equality goes back much farther, even to antiquity (Muller, 1963).

Though obviously not put in practice everywhere, the precept of equality has made during the nineteenth and the current century enormous strides toward universal acceptance.

By a singular misapprehension, partisans of equality have usually espoused varieties of the tabula rasa myth, while those who favor inequality believed in some forms of genetic predestination. This is quite illogical. If all people were as similar at birth as monozygotic twins, then it would not matter who is to be trained to do what. Conversely, equality of opportunity constitutes a practical recognition and acceptance of the fact of genetic diversity. The line dividing those who favor equality from those wishing to conserve inequality should be drawn somewhere else. The issue is whether every individual ought to be evaluated on his own merits or whether the social class or race of his ancestors suffice to define what he is likely to achieve.

Adoption of equality of opportunity as a social policy has genetic consequences which are rarely understood either by the champions or by the opponents of this policy. As pointed out above, in a meritocracy the place achieved by an individual in the society is a function of his manifested ability. However, the variance of abilities has a genetic component. Therefore, the achieved role, status, and economic level will to some extent be functions of the individual's genes. The occupational elites formed under equality of opportunity will tend to be genetic elites, while in caste societies social stratifications were genetically gratuitous. Formation of genetic elites is probable at least in the long run, even though Jencks et al. (1972) find that the correlation between intelligence ("cognitive skills") test scores and the occupational status in the United States is relatively weak. The same authors (p. 220) find that

in the United States "The most genetically advantaged fifth of all men appear to have incomes about 35 to 40 percent higher than the most genetically disadvantaged fifth". Scarr-Salapatek (1971, p. 1225) aptly characterizes the situation thus: "The greater the environmental equality, the greater the hereditary differences between levels of the social structure. The thesis of egalitarianism surely leads to its antithesis in a way that Karl Marx never anticipated."

Does it follow that all that equality of opportunity could accomplish will be replacement of social classes based on accidents of birth by genetically different and thus even more unalterably fixed social classes? This is not necessarily so. I have suggested (Dobzhansky, 1973) that under complete equality of opportunity there will be formed aptitude aggregations, which in important respects will be novel phenomena, unlike any social classes with which we are familiar. Suppose that equal opportunity will create a situation where every trade, craft, occupation, and profession will at a given time include all or most persons genetically qualified for the respective occupations. It is probable that in these aggregations few if any individuals will be homozygous for all the genes that make them prefer the respective occupations. Human populations, and in fact those of most sexual and outbreeding species, are genetically far too heterogeneous for such homozygosis. In every aptitude aggregation and in every generation, the Mendelian recombination will therefore keep producing individuals with genotypes that favor occupations other than those of their parents. In traditional social classes, even relatively open ones, parents liked to have their children "inherit" their occupation and their status. This tends to frustrate the correspondence between occupation and genetic

predisposition. It would make more biological as well as sociological sense if the aptitude aggregations will exchange parts of their progenies in accord with the proclivities and qualifications of the latter.

Precise assignment of individuals to aptitude aggregations according to their genetically conditioned proclivities seems utopian at present. Perhaps the greatest obstacle is that the upbringing and training of children is usually managed in nuclear families by the parents of the respective children. The home environment and family background play important roles in the formation of a child's habits and tastes, not to speak of his physical health and development. But home environments depend to some extent on the genetic endowments of the parents as well as of the children. The resulting feedbacks make the relations between the genetically conditioned cognitive skills, education, and social status staggeringly complex.

Jencks and collaborators (1972) have made strenuous efforts to unravel these feedbacks and covariances.¹ They find (p. 138) that in the United States "One of the ways economically successful families try to help their children retain their privileges is by making sure that their children 'get a good education.' Such efforts are moderately successful. The correlation between a white child's educational attainment and his father's occupational status is almost 0.50." This is no doubt even more true in many countries other than the

United States. Different kinds of education were traditionally designed for scions of different socioeconomic classes, or else education was one of the privileges of the upper class alone. A radical departure from these time-honored ways is being tried in countries otherwise as different as the Soviet Union, China, and Israel. When both parents are employed, the child care is more and more likely to devolve on communal nurseries and schools. Trained professionals can then provide undiscriminatory direction for the development of socially useful potentialities of their charges. How successful these experiments will be remains to be seen. They entail sharp alterations of the parent-child relationships that are traditionally regarded "normal" or "natural".

BEYOND EQUALITY OF OPPORTUNITY

Suppose that two persons with approximately similar genetic endowments were brought up, one in an advantaged and the other in a disadvantaged home environment. Quite clearly, these two persons did not have equal opportunities. To be "equal" in fact as well as in name, equal opportunity has to extend for more than a single generation. Strangely enough, this simple fact is often ignored in discussions of human equality.

An impediment that is even more serious for realization of human equality in the face of genetic diversity is that some socially valued abilities are relatively abundant while others are scarce. Rather few people can become, for example, musical virtuosi or conductors of symphony orchestras. Many more can perform well, or at least acceptably, as farmers, manual laborers, clerks, waiters, or janitors. The possessors of abilities that are rare but greatly appreciated are likely to achieve high status and large incomes. This is even more true in societies that permit social mobility than in rigid class societies.

¹ I became acquainted with the admirable work of Jencks and his colleagues (1972) only when my own book entitled *Genetic Diversity and Human Equality* was in the page-proof stage. In a way, the present article is an extended comment by a geneticist on the work of these distinguished social scientists. My admiration is tempered only by a regret that Jencks and his colleagues confound human genetic diversity with inequality, in the title as well as throughout their book. What they refer to as "inequality in cognitive skills" is to a large extent the genetic diversity of cognitive skills in human populations.

Why should it be that almost everybody can be trained as a manual laborer, but only few can learn to conduct symphonies? This is one of simple questions that do not have really simple answers, and furthermore no detailed discussion of this problem can be given in the present article. Reference has already been made above to what is probably the most fundamental and distinctive trait of the species *Homo sapiens*. This is the human educability or trainability, established by an unrelenting pressure of natural selection in the course of human evolution. People can be trained for many more kinds of work than any animal, wild or domestic, can possibly be. Yet the educability is not limitless. Some individuals have special abilities that others simply do not have, or have some abilities developed much above the population average. The adaptedness of the human species for its way of life is based on culture and educability. The developmental plasticity which results from the educability is, however, supplemented by genetic diversity. Some individuals take to certain kinds of training and work with ease and pleasure, while other individuals have little or no success in the same kinds of training. The myths of *tabula rasa* and of genetic predestination are both equally deceptive; the truth is found in-between.

Equality of opportunity does not by itself lead to equality in educational attainments, occupational statuses, and incomes. The important study by Jencks et al. (1972) provides a much needed analysis of the interactions of these variables with genetic diversity and with each other in the United States. The precept of equal opportunity does not seem to most Americans incompatible with inequalities in virtually every sphere of life, because (p. 3) "some people are more competent than others, and this will always be so, no matter how much we reform society. Many also believe

that competence should be rewarded by success, while incompetence should be punished by failure." In particular, (p. 16) "The principal arguments against equalizing incomes is that some people contribute more to the general welfare than others, and that they are therefore entitled to greater rewards." Jencks and his collaborators find however that the data examined in their book (p. 262)

show that neither genetic inequality nor disparities in family backgrounds dictate anything like the degree of economic inequality now found in American society. It is true that genetic diversity almost inevitably leads to considerable variation in people's cognitive skills. But variation in cognitive skills need not result in any significant degree in income inequality, even in a society where income depends to a large extent on competitive advantage.

The conclusion is warranted that the genetic diversity can be made compatible with equality of opportunity. Suppose, however, that a fair approximation to an equality of opportunity is reached. Would this mean that a society needs no further improvement in the direction of equality? The answer hinges on one's ethical standards and political ideals. At present, most of the world is still far removed from the equal opportunity stage. Closer approaches may then be regarded the proximate goals of social and political action.

One may however wish to peer beyond the equal opportunity horizon. Jencks et al. (1972) have done so and come upon a multitude of intractable problems. None of these problems are really new, but they are rarely considered in the context of genetic diversity. Jencks et al. have done this only partially, probably because to them the genetic diversity is merely one more kind of inequality, albeit the kind particularly resistant to all attempts to control it; yet inequalities are man-made social designs, while the genetic diversity is a part of nature. Here I can do no more than to refer

the reader to Jencks et al. and conclude by quoting the last paragraph of their concluding chapter (p. 265):

In America, as elsewhere, the general trend over the past 200 years has been towards equality. In the economic realm, however, the contribution of public policy to this drift has been slight. As long as egalitarians assume that public policy cannot contribute to economic equality directly but must proceed by ingenious manipulations of marginal institutions like the schools, progress will remain glacial. If we want to move beyond this tradition, we will have to estab-

lish political control over the economic institutions that shape our society. This is what other countries usually call socialism.

Let me reiterate once more that whether you do or do not "want to move beyond this tradition" is a problem very largely of ethics, and only marginally of genetics and biology.

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