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### **HEREDITY AND HEREDITARIANISM**

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Heredity is usually defined as the genetic transmission of characteristics from parent to offspring. This, however, is an oversimplification. The child does not inherit characteristics or traits from its parents. Children do not inherit musical ability, criminal tendencies, or IQ. Neither do they inherit physical characteristics such as skin or hair color. The child inherits one set of allele's from each parent. Together they form the child's genotype. The child also inherits mitochondria which are outside the nucleus of the cell. Genes code for the production of protein's which in turn interact with the environment to produce a phenotype. What we refer to as traits or characteristics are the phenotypes. The human being in all his or her complexity is the result of this interaction of a unique genotype with a unique environment.

The modern study of heredity began with the rediscovery in 1900 of the work of Gregor Mendel (1822-1884) by Hugo De Vries, Karl Correns, and Erich Tschermak. Mendel discovered the basic laws of segregation and independent assortment of paired alleles which opened the way for the modern science of genetics. The American geneticist, Thomas Hunt Morgan (1866-1945) carried on studies of heredity in *Drosophila* (fruit fly) and was awarded the Nobel prize in 1933 for his discoveries relating to the laws and mechanisms of heredity. Morgan showed the existence of genes located at specific sites on chromosomes. These theoretical discoveries enabled George Shull, operating at the Carnegie Institution's genetics research facility at Cold Spring Harbor to develop the technology of plant hybridization. The practical result was a revolution in farming techniques which vastly increased the worlds food production between 1920 and 1950. This "Green Revolution" led many to believe that the science of genetics would banish hunger. It also led some to an exaggerated belief in the power of genetics to explain human character traits and solve human social and political problems (hereditarianism).

Hereditarianism or biological determinism, as it is also called, is the belief that individual differences in human beings can be accounted for primarily on the basis of genetics. Further, many hereditarians believe that racial or ethnic groups differ, on average, in socially important traits such as intelligence, altruism, and aggression. Hereditarians have explained race and class differences as reflecting differences in innate ability. *Webster's Third International Dictionary* defines *racism* as "the assumption that psycholcultural traits and capacities are determined by biological race and that races differ decisively from one another which is usually coupled with a belief in the inherent superiority of a particular race and its right to domination over others." Thus, hereditarianism has been associated, from its origins with racism.

Francis Galton (1822-1911) may be considered the father of modern hereditarianism. Galton, Charles Darwin's half-cousin, is best know as the founder of the eugenics movement. He coined the term eugenics in 1883, in his widely-read book, *Inquiries into Human Faculty and its Development*. Galton took the word from the Greek "eugenes," which means "to be well born." He defined eugenics as a "science" that "takes cognizance of all influences that tend in however remote a degree to give the more suitable races or strains of blood a better chance of prevailing speedily over the less suitable than they otherwise would have had." Galton noted that the Negro, Hindu, Arab, Mongol, and Teuton all have "their peculiar characters," which "are transmitted, generation after generation." (Galton, 1865/1976, p. 26). He believed that whites were intellectually superior to blacks and he hoped "inferior" races would gradually become extinct.

Galton's British disciples including Karl Pearson, R.A. Fisher, Charles Spearman, Cyril Burt, Raymond B. Cattell, and Hans J. Eysenck, have all been advocates of eugenics. In the United States the eugenics movement was sponsored by leading psychologists such as Robert M. Yerkes, Carl C. Brigham, Lewis M. Terman, and Henry H. Goddard and reached its peak of influence in the 1920's. By 1930, a majority of states had passed eugenic sterilization laws which allowed for the forced sterilization of people thought to have bad genes. In 1924, the eugenics movement aided in the passage of the Johnson Immigration Restriction Act, which restricted the immigration of racial and ethnic groups thought to be biologically inferior to the Western European white Protestant stock which made up the majority of the

country. In Europe, the eugenics movement peaked with the rise of Adolf Hitler and the Nazi Party. Eugenic ideology in Nazi occupied Europe led to the sterilization of millions of individuals, death camps, and breeding farms.

On the opposite side of the spectrum are the behaviorists or social determinists. The father of behaviorism is John Locke (1623-1704). Locke advanced the idea that the mind was a *tabula rasa* or blank slate at birth. Behaviorists postulate there are no prenatal differences. The leading exponent of behaviorism in the United States was the American psychologist, John B. Watson (1878-1958). Watson argued that the environment in which the child is brought up determines intelligence and character. He claimed that given complete control over the environment of a child he could guarantee to train him to become any type of specialist - "doctor, lawyer, artist" and even "beggar man and thief" - regardless of the talents or tendencies of his parents or race.

The debate between the hereditarians and the behaviorist is known as the "nature-nurture controversy." Between the two extremes are exponents of the "norm of reaction" concept. Jerry Hirsch, a behavioral geneticist, has been one of the leading exponents of this position. The norm of reaction is the range of possible phenotypes which may develop from any genotype. According to this concept, each unique genotype can develop into various phenotypes. In fact, theoretically, each genotype can develop into an infinite number of possible phenotypes. For example, a seed would grow differently in different soils or with changes in moisture and temperature. One of the most dramatic experimental demonstrations of this idea was presented by Charles R. Stockard (1879-1939) who created a cyclops fish by treating the water in which the embryos were developing. This is why we say that the child does not inherit "traits" from his or her parents. The child inherits only alleles. It is the interaction of these alleles with the environment that creates phenotypes.

Let us take, for example, the case of mental deficiency and the genetic disease known as PKU (phenylketonuria). It has been known since the 1930s that a particular genotype causes an error in the metabolism of the amino acid phenylalanine, a common constituent of milk products, resulting in high levels of phenylpyruvic acid in the body. For reasons still not well understood high levels of phenylpyruvic acid in the developing child results in mental deficiency. In this case, it seems particularly clear that a given

genotype "causes" mental deficiency, but appearances can be deceiving. If the child is raised on a diet containing no phenylalanine, normal intelligence can develop. The genotype did not cause any phenotype. The phenotype was caused by an interaction of the genotype with phenylalanine.

The implications of this position are that there are genetic correlates to physical as well as behavioral traits. However, correlation should not be confused with causation. Genes do not "cause" a trait any more than environment does. It is the interaction between the two that results in phenotypic traits. The norm of reaction position rejects both the biological and the social determinist views. If one takes seriously the concept of the norm of reaction it is apparent that social engineering can alter child development. However, the child is not a *tabula rasa* to be easily molded into a scientist or a thief. The child has a genotype and there are genetic correlates of behavior. What might transform one child, say a PKU baby, from mental deficiency to mental normalcy, may not work for another child. While the advocates of this middle position reject both biological and social determinism, they have been primarily concerned with pointing out the problems and dangers of genetic determinism.

The debate between hereditarians and social determinists (sometimes referred to as environmentalists) has raged for over a century. The hereditarians have predominated during most of this time. Only during the period from 1945 to the mid-seventies have social determinists held the dominant position. The debate is not entirely over the merits of scientific evidence. Nicholas Pastore was one of the first to investigate the relationship between the outlook of scientists on the nature-nurture debate in his classic study, *The Nature-Nurture Controversy* (New York: King's Crown Press, 1949). Pastore concluded that the social and political allegiances of the scientists were a significant determinant of their position on the issue. Those who favored the hereditarian view tended to be conservative. They viewed the social order as a natural result of variation in talent and character. They tended to explain class and race differences as likewise the result of innate group differences. The behaviorist or environmentalist, on the other hand, were more likely to be liberals or leftists. They believed economic disadvantage and structural problems in the social order were to blame for group differences. They also believed in the power of social engineering to alter class and race discrepancies.

Thus, in the aftermath of World War II, when the U.S. economy was booming and faith in social engineering was at its height, the social determinists ideology held sway. During the period of the civil rights movement and the Great Society social scientists were committed to an egalitarian ideology. They created a wealth of programs such as Head Start, food stamps, Aid to Families with Dependent Children (AFDC), and Affirmative Action aimed at transforming and perfecting society.

With the economic problems of the seventies and the rise of the New Right, more conservative ideologies returned to dominate social science thinking. Beginning with the appearance of sociobiology in the mid-seventies, there has been a distinct rise in the number of studies which emphasize genetic theories of crime, intelligence, alcoholism, and mental illness.

How far the contemporary resurgence of hereditarianism will go is uncertain. There have already been calls for a renewed eugenics. In 1969, Arthur Jensen called for "eugenic foresight" in government policies dealing with African Americans. William Shockley, Richard Herrnstein, and Lloyd Humphreys among others have warned of declining intelligence in the U.S. and called for eugenic policies to stem the tide of degeneracy. Most recently, J. Philippe Rushton, a professor of psychology at the University of Western Ontario has brought back nineteenth century notions of craniometry arguing that Asians, whites, and blacks differ in cranial capacity. He further states that numerous traits show Asians and whites superior to blacks. According to Rushton, Orientals and whites have evolved into races that are more intelligent, family oriented, and law-abiding than Negroes. The Negro race is, on the whole, smaller brained, slower to mature, less sexually restrained, and more aggressive than its white and Asian cousins. Richard Lynn, another prominent supporter of the new eugenics wrote in 1974: "If the evolutionary process is to bring its benefits, it has to be allowed to operate effectively. This means that incompetent societies have to be allowed to go to the wall.... What is called for here is not genocide, the killing off of the populations of incompetent cultures. But we do need to think realistically in terms of the 'phasing out' of such peoples."

How far this trend will go is uncertain. There has emerged a vigorous opposition to the new eugenics which is aided by the memory of horrors that biological determinism in the form of Nazi ideology has wrought in the twentieth century. America is today the world's most successful experiment in multi-cultural democracy. Minority ethnic and racial groups wield far more political and social power than they

did in the 1920s and 1930s. When Frederick Goodwin, director of the federal governments Mental Health Administration, announced a government plan in 1992 to identify 100,000 inner city children whose alleged biochemical and genetic defects would lead them to violence later in life, a hue and cry emerged from a coalition of African Americans politicians, civil rights leaders, and scientists which quickly scuttled the program. The call for such programs will continue, however. Clearly, the debate over heredity and hereditarianism will continue to rage.

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