

FEATURE ARTICLE/ HISTORICAL PERSPECTIVES Eugenics: Past, Present, and the Future

Kenneth L. Garver*† and Bettylee Garver*

*Department of Medical Genetics, Western Pennsylvania Hospital, and
†Department of Human Genetics, University of Pittsburgh, Pittsburgh



Summary

During the past 20 years there has been a resurgence of interest in the history of the eugenics movements, particularly those of the United States and Germany. Unfortunately, most of these accounts have been published in nonmedical and nongenetic journals, so they are not readily available to geneticists or physicians. The authors of this article are concerned about the lack of information that geneticists, physicians, and students have concerning the origin and progress of these movements. This article provides a short history of the American and German eugenics programs and concludes with a review of their possible relations to our current practices. It is hoped that this will encourage institutions to include, in master's, Ph.D., and M.D. programs in human genetics, lectures, seminars, and journal clubs on the topic of eugenics.

Introduction

Health professionals should reflect with great concern on the history of eugenics, so that we do not repeat the pattern. Mary Elizabeth Coleridge states that "if men could learn from history, what lessons it might teach us!! But passion and party blind our eyes, and the light which experience gives is a lantern on the stern, which shines only on the ways behind us!!" (The Oxford Dictionary of Quotations 1953, p. 152).

Let us review some basic definitions. *Eugenic* comes from the Greek word *eugenès* (*eu* [well] and *genos* [born]). The term refers to improving the race by the bearing of healthy offspring. *Eugenics* is the science that deals with all influences that improve the inborn quality of the human race, particularly through the control of hereditary factors. A *eugenic program* is a

public policy structure designed to have its effect on gene frequencies in whole populations. *Negative eugenics* is a systematic effort, whether decisional or programmatic, to minimize the transmission of genes that are considered deleterious. *Positive eugenics* is a systematic effort, whether decisional or programmatic, to maximize the transmission of genes that are considered desirable. Another term that is relative is *genocide*, which is the deliberate extermination of an entire human ethnic, political, or cultural group.

The formal study and application of eugenics as we know it today was founded by Sir Francis Galton, who first used the word *eugenics* in 1883 to describe the science for the biological improvement of the human race (Galton 1865, 1901, 1905). Galton was convinced that a wide range of human physical, mental, and moral traits were inherited. He therefore reasoned that progress of the human race depended on improving the selective transmission of the population's hereditary endowment to future generations (Blacker 1952; Cowan 1972a, 1972b; Childs 1973; Allen 1983; Rosenberg 1985). Galton's ideas of eugenics developed slowly until the early 1900s, largely because of the lack of any solid scientific theory of inheritance

Received February 4, 1991; final revision received May 31, 1991.

Address for correspondence: Kenneth L. Garver, M.D., Ph.D., Department of Medical Genetics, Western Pennsylvania Hospital, 4800 Friendship Avenue, Pittsburgh, PA 15224.

© 1991 by The American Society of Human Genetics. All rights reserved.
0002-9297/91/4905-0030\$02.00



on which to build his premise. However, in the early 1900s Mendel's laws of inheritance were rediscovered and applied to human genetics, and this opened an entirely new set of principles with which to study inheritance in human beings (Russ 1976; Allen 1979).

The Eugenics Movement in the United States

The eugenics movement in the United States was nourished by both the rediscovery of Mendel's laws of inheritance and the belief that all or at least most human characteristics could be genetically determined and passed down from parent to offspring (Lindeman 1936; Allen 1975*b*, 1979, 1984; Sapp 1983). The gene was regarded as a unit that would not change, and, hence, predictions could be made about the genetic worth of children by looking at the genetic worth of their parents. Biologists also believed that many human conditions, such as feeble-mindedness, congenital defects, epilepsy, and other diseases were inherited by direct transmission and, hence, could be controlled by the use of negative eugenics (Haller 1963; Ludmerer 1972*a*; Kevles 1985). During the first part of the 20th century in the United States, there was increasing concern about social issues such as degeneracy, drunkenness, unemployment, criminality, prostitution, and chronic alcoholism, which were believed to be genetically related and, hence, to be controllable by eugenic measures (Haller 1963; Ludmerer 1972*a*; Allen 1974, 1975*a*; Popkin 1974; Murphy 1975; Beckwith 1976; Searle 1976; Paul 1984; Kevles 1985; Smith 1985).

During the late 19th and early 20th centuries, there were an increasing number of biologists and other scientists who, together with social workers, philanthropists, and politicians, were concerned that the population of the United States was moving away from the "Anglo-Saxon superiority" to a lower level because of the increased immigration from southern and eastern Europe (Allan 1936; Dice 1952; Reed 1957; Dunn 1962; Ludmerer 1969; Osborn 1974; Reilly 1983*b*). These factors (rediscovery of Mendelism, social issues, unemployment, and immigration) all nurtured an increased interest in eugenics.

Perhaps the most important stimulus for a formal eugenics program in the United States was the establishment by Dr. Charles Benedict Davenport of the Eugenics Record Office (ERO) at Cold Spring Harbor, Long Island, in 1910 (Allen 1986). The ERO was associated with the Station for the Experimental Study of Evolution (SEE), which had been established in

Cold Spring Harbor in 1904 with the financial support of the Carnegie Institution.

Dr. Davenport was one of the early leaders of the eugenics movement in the United States. Another individual who contributed was Dr. Harry Hamilton Laughlin, who was recruited by Davenport to become superintendent of the ERO (Bird and Allen 1981). The ERO had two general purposes. The first was to carry out research in human heredity, especially the inheritance of social traits, and the second was to educate lay persons about both the importance of eugenic research and the implications that eugenic findings had for public policy. During the next several decades, Davenport and Laughlin worked tirelessly to advance the cause of eugenics scientifically—and, in particular, to lecture both the professional and lay public about their views on how to "improve" the race.

Johnson Immigration Restriction Act of 1924

Until 1921 the United States had maintained an open-door immigration tradition for people of most nationalities. At the close of World War I, there had been an initial attempt to pass an immigration-restriction law based largely on economic positions. A temporary measure was passed in 1921 to combat unemployment resulting from the slowdown of the economy and the return of soldiers from the front. Between 1921 and 1924, however, eugenicists, in conjunction with the Immigration Restriction League, worked for the passage of a more comprehensive and permanent law (Ludmerer 1972*b*; Thielman 1985).

Laughlin played an important role because of his appointment, in April 1920, as the expert eugenics agent of the House Committee on Immigration and Naturalization (Bird and Allen 1981). During the debates over immigration restriction, he appeared before the committee on several occasions, always presenting the view that the biologically inferior new immigrants were threatening to wipe out the established Anglo-Saxon population. Laughlin's evidence for such a statement was unjustified by the facts which he brought forth. He included references to the persistence of degeneracy in immigrant families, to their low scores on IQ tests, and to claims that conditions such as shiftlessness, alcoholism, and insubordination were genetic traits appearing far more frequently in the new foreign-born immigrants. Herbert Spencer Jennings of Johns Hopkins was finally called to testify by the Committee on Immigration and Naturalization. However, Jennings, who was a strong opponent of the eu-



genics movement, was given only 5 min on the final day of the hearings. If given more time, Jennings and other scientists could have discredited some of the earlier testimony and explained that IQ tests were given in English to immigrants who, in many cases, could not speak or read the language.

There were significant differences among members of the House as to how to regulate immigration. After much debate, it was agreed to base immigration on the 1890 census. Under this interpretation, immigration of the so-called Nordic or Anglo-Saxon stock—namely, people from northwestern Europe and Great Britain—was greatly favored over immigration of those from southern and eastern Europe, particularly Jewish immigrants. Laughlin felt that immigrants from southern and eastern Europe, especially Jews, were so radically different from and genetically inferior to the current American population that any racial mixture would be deleterious (Allen 1975*a*; Beckwith 1976).

The passing of the Johnson Restrictive Immigration Act of 1924 was perhaps the greatest triumph for the American eugenics movement, particularly for Laughlin, Davenport, and the ERO. In retrospect the passage of the Johnson Restrictive Immigration Act can be seen as the misuse of pseudoscientific and incorrect genetic information in order to justify prejudicial viewpoints.

Eugenic Sterilization Laws in the United States

Interest in eugenic sterilization in the United States began in the late 19th century because of concerns about criminals, the insane, and feeble-minded persons (Punnett 1917; Fisher 1924). This concern quickly expanded to include alcoholics, paupers, orphans, derelicts, delinquents, prostitutes, and those unable to support themselves (Beckwith 1976). At first, reformers were optimistic about helping such individuals. However, by the end of the century more reformers came to believe that these conditions resulted from deficient heredity and thus could not be ameliorated or eliminated by environmental procedures. An important event preceding the rise of sterilization programs was the 1875 publication of a study of the Jukes, a New York family with a propensity for almshouses, taverns, brothels, and jail (Dugdale 1877). This was followed in 1912 by the publication of an immensely popular study of the Kallikak family, which had both an eminent line and a degenerative line running in parallel over many generations (Smith

1985) This book did much to galvanize support for programs of negative eugenics.

During the 1890s, campaigns for legislation which prescribed the sterilization of the “unfit” were begun. In 1897 a bill calling for the castration of both the feeble-minded and certain criminals was introduced and discussed in the Michigan state legislature, where it was ultimately defeated. Some institutions proceeded to sterilize without legal authorization. For example, at the Kansas State Institution for Feeble Minded children, Dr. F. Hoyt Pilcher castrated 44 boys and 14 girls before strong public disapproval forced him to stop (Muller 1933; Allen 1980*b*; Reilly 1983*a*, 1987).

In 1907, Indiana became the first state to pass an involuntary-sterilization measure based on eugenic principles. This law required the sterilization of inmates of state institutions who were insane, idiots, imbeciles, feeble-minded, convicted rapists, or habitual criminals. This procedure had to be recommended by a board of experts which was determined by each state. By 1931, 30 states had passed involuntary-sterilization measures. Some of these laws applied to a very wide range of “defectives,” including “sexual perverts, drug fiends, drunkards, epileptics, and diseased degenerate persons” (Buck v Bell Superintendent 1927).

During the 1960s, the practice of sterilizing retarded persons in state institutions virtually ceased, but the laws remained. In 1961, there were eugenic-sterilization laws in 28 states. There has been a trend to repeal the laws, and, as of 1987, eugenic sterilization of institutionalized retarded persons was permissible in 19 states; but the laws are now rarely invoked. A few states have even enacted laws that expressly forbid sterilization of persons in state institutions.

During the past 10 years, the discussion of sterilizing the mentally retarded is no longer in a genetic context. The main issue is how to protect the incompetent person—and the right of that person to be sterilized if he or she is being sexually abused. The courts must be convinced that the operation will benefit the patient (Reitman et al. 1978; Petchesky 1979; Fost et al. 1990).

A review of the history of eugenic sterilizations in the United States makes it evident that many abuses have occurred since thousands of persons who were not mentally retarded were forcibly sterilized. Many individuals were also involuntarily sterilized mainly because of their race (black) or because of poverty and inability to pay for the care of themselves and their



children (Buck v. Bell Superintendent 1927; Reilly 1983a, 1987; Fost et al. 1990).

The Eugenics Movement in Germany

The racial hygiene movement in Germany was very active in the late 19th century when Drs. Wilhelm Schallmayer and Alfred Ploetz began to express their views concerning racial hygiene (*Rassenhygiene*) (Weiss 1986; 1987; Proctor 1988). Drs. Schallmayer and Ploetz are regarded as the founders of the German eugenics movement. The early interest in racial hygiene in Germany was stimulated first by (a) social problems caused by rapid and progressive industrialization (Chase 1980; Weindling 1989) and (b) concern about the concepts of social Darwinism, in which the more elite and “therefore better segments of the population” were underproducing in comparison with the working-class elements (Proctor 1988, p. 19). They also realized that the various German wars were a counterselective process, since the “flower of the nation” was going off to war and being killed, while the men who were rejected by the army were at home reproducing. Initially, the racial hygiene movement had no true racist or political overtones, in that it was concerned about the future of the German nation including all of its racial and ethnic groups. Later, many others used racial hygiene as a basis for a more eugenic approach, by emphasizing the supposed inferiority of blacks, Jews, and eastern Europeans (Weindling 1985; Weiss 1986, 1987; Proctor 1988).

One of the first intrusions of German eugenic ideas into private life came in 1908 when, in the German colony of Southwest Africa, all existing mixed marriages were annulled and forbidden in the future, and the Germans involved were deprived of their civil rights (Müller-Hill 1988). This episode is described in 1913 in Dr. E. Fischer’s book, *The Bastards of Rehoboth and the Problem of Miscegenation in Man* (*Die Rehobother Bastards und das Bastardisierungsproblem beim Menschen*).

A decree of the German Ministry of the Interior on February 6, 1936, stated that a system of records was to be set up to cover hereditary-biological data on all patients in mental hospitals and institutions. To us this might seem like a perfectly logical way of getting data for evaluating hereditary traits. This was later misused to provide documentation for the purpose of exterminating these patients.

RuSHA was an agency of the SS and included the Race Bureau and the Marriage Bureau. One of the func-

tions of the Race Bureau was to decide on the “Aryan qualities” of individuals belonging to conquered nations and on their potential for “Germanization.” The Marriage Bureau conducted premarriage medical examinations of SS candidates and their fiancées. In both cases, applicants were required to produce documentation of Aryan ancestry going back to 1800 (Müller-Hill 1988).

After 1933, when the Nazis came to power, the zeal of young physicians to identify themselves with Naziism increased to the extent that they became the largest professional group in the party. As the Nazi party began to promulgate its ideas concerning racial hygiene, many physicians readily endorsed the movement and accepted the mission of changing their role from doctor to the individual to “doctor of the nation.” During the years after the Nazi ascension to power, there was a change in attitude of these physicians, from that of recognizing all life as valuable to that of life not being worth living. The early biological and intellectual racial hygiene movement in Germany developed into a political/racial hygiene movement designed to demonstrate a supposed difference in value of the various population groups (Tenenbaum 1956; Weiss 1986).

In Germany, the rediscovery of Mendel’s work at the beginning of the 20th century was an impetus that was used by biologists to help formulate eugenic policies. They used Mendel’s theory to indicate the inheritance patterns of many of what they claimed were undesirable traits, such as mental retardation, mental illness, criminality, drunkenness, prostitution, and poverty. The ideas of racial hygiene became relevant to Hitler in 1923 while he was imprisoned in Landsberg, where he read the second edition of the textbook by E. Baur, E. Fischer, and F. Lenz: *The Principles of Human Heredity and Race-Hygiene* (*Menschliche Erblchkeitslehre und Rassenhygiene*). He subsequently incorporated these racial ideas into his own book, *My Struggle* (*Mein Kampf*). To understand the German eugenic movement, it is necessary to trace the interrelationship of their race hygiene, euthanasia, involuntary-sterilization, and genocide programs (Allen 1980a; Motulsky 1986; Pfaafflin 1986).

Euthanasia

In Germany, “mercy killing” began to be openly discussed in intellectual circles in the last decade of the nineteenth century. In 1895, Adolf Jost published a book, *The Right to Death* (*Das Rech auf den Tod*), which promoted direct medical killing and indicated

that control over the death of the individual must belong to the state.

In 1920, the jurist Professor Binding and the psychiatrist Professor Hoche published a book, *The Sanctioning of the Destruction of Lives Unworthy to Be Lived* (*Die Freigabe der Vernichtung Lebensunwerten Lebens*). To our knowledge, this is the first time that the Germans used this phrase that became a standard during the Nazi eugenics movement. This book included as “unworthy life” not only the incurably ill but also the mentally ill, the feebleminded, the retarded, and deformed children (Sherlock 1987; Seidelman 1989).

On August 7, 1929, Adolph Hitler spoke in public of killing German infants with physical defects—a slaughter, he estimated of 700,000 children annually. Most other scientists in Germany felt that this was a tremendous overexaggeration of the number of children with mental retardation and other birth defects (Müller-Hill 1988).

Germany’s euthanasia program began with the destruction of children born with birth defects, mental retardation, and genetic disease. A prototype case that occurred in the fall of 1938 involved a child who was born blind, retarded, and without an arm and a leg. The child’s father appealed directly to Hitler, asking that the child be granted a mercy death (Lifton 1986).

This case provided a model on the basis of which other infant and child euthanasia actions could be carried out. Hitler then established an advisory committee to prepare for the killing of deformed or retarded children. The project was organized under the name “Committee for the Scientific Treatment of Severe Genetically Determined Illness.” On August 18, 1939, this committee produced a secret report delivered to all state governments, asking that midwives or doctors delivering any child with congenital deformities—such as idiocy or mongolism, microencephaly, hydrocephaly, missing limbs, malformations of the head, spina bifida, spastics, etc.—register that child with local authorities (Lifton 1986).

The data from these births were tabulated on questionnaires which were returned to Berlin by the physicians or midwives. There they were examined by a group of “experts” and were sorted according to whether they were to be exterminated or allowed to live. Children slated to die were marked with a plus sign, and children who were allowed to live were marked with a minus sign. These decisions of life and death were made entirely on the basis of these questionnaires, as the panel doing the selection never ex-

amined the children. Children who were destined for extermination were transported into any one of 28 institutions which had rapidly been equipped with extermination facilities.

The program began by exterminating children up to the age of 3 years who had birth defects. By the fall of 1941, the children’s euthanasia program had been extended to include those up to the age of 17 years. By 1943, the program was broadened to include healthy Jewish children and healthy children of other unwanted races (Mitscherlich 1949).

After the invasion of the USSR on June 22, 1941, a special action group was organized for the specific purpose of exterminating Jews, Gypsies, mental patients, and other “undesirable elements,” usually by shooting. Similar groups were active on a smaller scale in Poland in 1939–40. After the German armies launched their attack against the USSR, the *Einsatzgruppen* began their mass murders of Jews, Gypsies, mental patients, and the Russians themselves.

On December 10, 1941, Heinrich Himmler ordered a commission composed of those physicians who were formerly concerned with euthanasia to be established to “comb out” prisoners in concentration camps who were unfit for work, ill, or “psychopaths.” Some tens of thousands of prisoners selected in this way were killed by gas in the extermination centers of Sonnenstein and Hartheim. Many extermination camps were staffed by medical personnel who originally worked in euthanasia hospitals. An example was Dr. Friedrich Mennecke, a physician involved in the euthanasia program, who wrote in a letter dated January 14, 1942: “The day before yesterday, a large contingent from our euthanasia program has moved under the leadership of Dr. Brack to the eastern battle zone . . . it consists of doctors, office personnel, and male and female nurses from Hadamar and Sonnenstein, in all, a group of 20–30 persons” (Müller-Hill 1988, p. 16). This group operated the extermination site of Chelmno, where Polish Jews and Gypsies were killed using carbon monoxide (Mitscherlich 1949; Müller-Hill 1988).

Eugenic Sterilization Laws in Germany

On July 14, 1933, the first involuntary sterilization law in Germany was passed. This law provided for the prevention of progeny with hereditary defects. It allowed for compulsory sterilization in cases of “congenital mental defects, schizophrenia, manic-depressive psychosis, hereditary epilepsy, severe alcoholism, hereditary blindness and Huntington’s chorea” (Alex-



ander 1949; LaChat 1975; Noakes 1984; Pfaafflin 1986). In the spring of 1937, a decision was made that all German colored children were to be involuntarily sterilized. After the prerequisite expert reports were provided, the sterilizations were carried out (Müller-Hill 1988).

As the war progressed, more manpower was needed for the farms and factories, and a decision was made that prisoners who were able to work should be spared extermination. However, the Nazis did not want these “undesirables” to procreate, so fast, effective techniques for sterilization were investigated and used (Alexander 1949; Poltawaska 1964; Lifton 1986).

Discussion

The preceding review describes how the German euthanasia movement of the late-1930s against severely retarded and deformed children in mental institutions was expanded to include at first older children with birth defects, Jewish children, and then adults who were judged as either incurable or having lives not worth living. After the invasion of Poland, and particularly after the invasion of Russia, many of the teams that participated in the involuntary euthanasia programs in Germany were sent into the conquered countries, where they set up death camps that were expanded to take care of political prisoners, Jews, and Gypsies, in addition to the people of the conquered countries. It is important to realize that the individuals who made the selection of prisoners to be killed were physicians and other health-related persons. It is apparent that the physicians themselves believed that this was the correct approach (Alexander 1949; Lifton 1986).

Interaction between the American and German Eugenics Movements

Many have claimed that most Americans were unaware of the eugenic measures that were instituted in Germany during the period of Nazi rule. However, there is much evidence that many Americans were not only aware but also supportive of the German eugenics movement. An early example of the close ties which the American eugenics movement had with those in Germany occurred during the International Congress of Eugenics in Rome in September 1929, when Dr. C. B. Davenport (Cold Spring Harbor), who was President of the International Federation of Eugenic Organizations, sent Mussolini a memorandum, written by Professor Eugen Fischer from Berlin, on the impor-

tance of implementing eugenics programs: “Maximum speed is necessary; the danger is enormous” (Müller-Hill 1988, p. 8). Shortly after this, Dr. Davenport asked Professor Fischer to become chairman of the Committee on Racial Crosses of the International Federation of Eugenic Organizations (Glass 1981; Müller-Hill 1988).

Of particular interest are reports from Germany during 1933–41 that were printed in the foreign-letters section of the *Journal of the American Medical Association* (Bloch 1973). These reports described the German sterilization and euthanasia programs, discrimination against Jewish physicians, reorganization of German universities, and many other topics. The German eugenic sterilization law passed on July 14, 1933, was based on a “model sterilization law” published by Dr. H. H. Laughlin in 1922 (Hubbard 1985).

Eugenics: Present and Future

There are some common threads as to the cause of the American and German eugenic movements. In both instances the ideas were introduced by sincere biologists and physicians who were concerned with the possible degeneration of a particular race. These ideas were made popular and more relevant by other factors. In the early 1920s in America, the increasing unemployment and increasing immigration of unskilled workers made it possible for a group of dedicated eugenicists to promulgate the unfounded claim that people from southern and eastern Europe, Jews, Negroes, and Asiatics were inferior and would dilute the Anglo-Saxon stock in the United States. This laid the groundwork for the passage of the Johnson Restrictive Immigration law of 1924.

Next, these same eugenicists lobbied for involuntary sterilization of the mentally retarded, the insane, rapists, habitual criminals, and social misfits; so, by 1940, 30 states had passed involuntary sterilization laws. According to Reilly, these laws were misused, so that individuals were sterilized primarily because of their race or their economic status (Reilly 1983a, 1987).

In Germany, the original concerns about racial hygiene in the late 19th century were expressed by scientists such as Wilhelm Schallmayer and Dr. Alfred Ploetz. By the beginning of the 20th century these concepts were beginning to be misused by those who had racist beliefs. The depression in Germany after World War I provided a stimulus for these beliefs to be expanded into the negative-eugenics program that became one of the landmarks of the Nazi racial hygiene movement.



With decreased federal and state monies, increased cost of medical care, and increased financial pressure on third-party carriers, there are already suggestions to minimize health care at the two ends of the spectrum—namely, (1) newborns with congenital malformations and genetic disease and (2) the elderly who, for some reason, are incompetent or chronically ill (Smith 1985; Kimball and Cooper 1990; Levinsky 1990; Relman 1990*a*, 1990*b*). Health care resources are being drained because of new technologies, and the suggestion of limited care for the elderly has been introduced. This concept of lives not worth living developed in Germany during the early 19th century and was expanded when the Nazis took over in 1933.

Another disturbing direction is the audit of genetic services. Everyone would agree that services provided for our patient's health, whether through a university or a private practitioner, should have some means of audit for quality, correct information, and effectiveness. Traditionally the goal was to have the patients understand the genetic disease and their risk of having an affected child—or their chance of having a normal child. Now it has been suggested that, for a genetic clinic to continue to be funded, it should show that the birth prevalence of a particular disease or malformation is declining and that the termination of pregnancies because of a particular disease is increasing in the population (Carter et al. 1971; Carter 1974; Chapple et al. 1987; Hoffenberg et al. 1989; Modell and Kuliev 1989; Bunday 1990; Clarke 1990*a*, 1990*b*; Davis 1990). In other words, the notion has now shifted to a cost-effective or utilitarian method regarding genetic counseling. This cost-effective attitude of genetic counseling is against the present purpose of most clinics in the United States—namely, that the patient be informed and educated and then make a decision based on his or her needs and ethical background, not primarily because of economic measures. Utilitarian reasoning was the basis of the Nazi eugenic policies (LaChat 1975; Lifton 1986).

One of the first phases of the German negative-eugenics movement was active euthanasia of newborns and young children with congenital malformations and mental retardation. Prenatal diagnosis and selective abortion of fetuses with malformations or genetic disease can be considered an earlier phase of the same philosophy—namely, the elimination of lives not worth living (Tormey 1976; Hubbard 1986). Those of us who were involved in the development of prenatal diagnosis stressed that its use was a decision to be made by the couple on the basis of their own moral and ethical beliefs. However, in the future,

limited financial resources for medical care could cause more pressure for the increased use of prenatal diagnosis and the subsequent abortion of affected fetuses (Carter et al. 1971; Carter 1974; Chapple et al. 1987; Hoffenberg et al. 1989; Modell and Kuliev 1989; Bunday 1990; Clarke 1990*a*, 1990*b*; Davis 1990).

The U.S. Human Genome Project

The U.S. Human Genome Project is the largest scientific project funded by the Federal Government since the Apollo Moon Project (Dulbecco 1986; Short 1988; McKusick 1989). The knowledge gained from this project should have tremendous implications, not only to physicians but to everyone, lay and professional, by providing a better understanding both of single-gene defects and of the common multifactorial or familial diseases such as diabetes, arteriosclerosis, and cancer.

More specifically related to eugenics is the fact that, in the past, various racial characteristics have been used in formulating eugenic policies, both negative and positive. If it is found that certain genomic sequences can be used to predict (*a*) physical or intellectual fitness in an individual or (*b*) predilection to a serious disease, will this become the 21st-century issue when government or third-party-payer policies are being implemented? (National Research Council 1988; U.S. Department of Health and Human Services and U.S. Department of Energy 1991).

Conclusions

It is sometimes difficult for us to reflect objectively concerning our actions and practices—particularly with regard to how new advances in science and technology and their applications to genetic counseling and clinical care in medical genetics can possibly be deleterious to our patients. In the past, however, we have seen how rather innocuous medical practices or public policies have been distorted to be applied as negative eugenics abrogating the rights and privacy of millions of individuals. It is painful to realize how some of our accepted practices today (e.g., prenatal diagnosis and MSAFP/HcG screening) can be considered as negative eugenics. However, when these technologies were introduced into medical practice, it was on the basis of a patient/physician relationship. In the future it could become public policy, and individual patients might lose, in many instances, their right to make a decision. This might not be their choice but one dictated by the subtle influences of economic pressures



and by the increasing reliance on utilitarian cost-effective criteria for making genetic decisions (Chapple et al. 1987; Clarke 1990a, 1990b; Wilfond and Fost 1990).

These technologies will increase in scope and effectiveness with each subsequent year. It is important that we, as geneticists, physicians, or other health care providers, realize the importance of protecting our patient's right to make his or her own decisions and to protect the confidentiality of his or her genetic records in the workplace, in relation to third-party carriers, the government, and other individuals. We must respect human life, protect those with birth defects and genetic disease, and support public policy from the standpoint of providing support for these individuals as far as educational opportunities and care. An important step in this direction was the signing into law by President Bush on July 26, 1990, of the Americans with Disabilities Act. This new law will help an estimated 3 million Americans with disabilities and has the force of a national law.

After reflecting on the Nuremberg trial for the Nazi medical crimes, a Protestant theologian, Dr. Karl Barth (1961, p. 424), wrote: "No community whether family, village or state is really strong if it will not carry its weak and even its very weakest members. They belong to it no less than the strong, and the quiet work of their maintenance and care, which might seem useless on a superficial view, is perhaps more effective than common labor, culture or historical conflict in knitting it closely and securely together. On the other hand, a community which regards and treats its weak members as a hindrance, and even proceeds to their extermination, is on the verge of collapse."

Acknowledgments

The authors wish to thank Joyce Deanovich for her expert secretarial assistance and Barbara Petcko for her help in proofreading the manuscript. Thanks also go to our students—Ellyn Hauselman, Karen Gamble, Kathleen Lent, James Burke, and Bronwyn Prytherch—for their technical assistance.

References

- Alexander L (1949) Medical science under dictatorship. *241:39–47*
- Allan W (1936) Medicine's need of eugenics. *South Med Surg* (August), pp 416–417
- Allen G (1974) A history of eugenics in the class struggle. *Sci People* (March), pp 32–39
- (1975a) Genetics, eugenics and class struggle. *Genetics* 79:29–45
- (1975b) The introduction of *Drosophila* into the study of heredity and evolution: 1990–1910. *ISIS* 66: 322–333
- (1979) The rise and spread of the classical school of heredity, 1910–1930: development and the influence of the mendelian chromosome theory. In: Reingold N (ed) *The sciences in American context: new perspective*. Smithsonian Institution, Washington, DC, pp 209–228
- (1980a) Racism as pseudo-science: the prophets of racism. *PL Magazine* 13(2): 28–35
- (1980b) The Work of Raymond Pearl— from eugenics to population control. *Sci People* (July/August), pp 22–28
- (1983) The misuse of biological hierarchies: the American eugenics movement, 1900–1940. *Hist Philos Life Sci* 5:105–128
- (1984) Thomas Hunt Morgan: materialism and experimentalism in the development of modern genetics. *Soc Res* 51:709–738
- (1986) The eugenics record office at Cold Spring Harbor, 1910–1940: an essay in institutional history. *OSIRIS* 2:225–264
- Barth K (1961) Church dogmatics, vol 3, no 4. T & T Clark, Edinburgh
- Beckwith J (1976) Social and political uses of genetics in the United States: past and present. *Ann NY Acad Sci* 256: 46–58
- Bird RD, Allen G (1981) The J.H.B. Archive report—the papers of Harry Hamilton Laughlin, eugenicist. *J Hist Biol* 14:339–353
- Blacker CP (1952) *Eugenics, Galton and after*. Hyperion, Westport, CT
- Bloch H (1973) The Berlin correspondence in the JAMA during the Hitler regime. *Bull Hist Med* 48:297–305
- Buck v Bell Superintendent. US Supreme Court (1927) United States Reports 274, United States Supreme Court (October term, 1926), 1927, pp 200–206
- Bundey S (1990) Letter to the editor. *Lancet* 1:1406
- Carter CO (1974) Current status of genetic counselling and its assessment. In: Motulsky AG, Lenz W (eds) *Birth defects*. Excerpta Medica, Amsterdam, pp 277–280
- Carter CO, Evans KA, Fraser Roberts JA, Buck AR (1971) Genetic clinic—a follow-up. *Lancet* 1:281–285
- Chapple JC, Dale R, Evans BG (1987) The new genetics: will it pay its way? *Lancet* 1:1189–1192
- Chase A (1980) *The legacy of Malthus*. The University of Illinois Press, Urbana, Chicago, and London
- Childs B (1973) Garrod, Galton, and clinical medicine. *Yale J Biol Med* 46:297–313
- Clarke A (1990a) Genetics, ethics and audit. *Lancet* 335: 1145–1147
- (1990b) Genetics, ethics and audit. *Lancet* 336:120
- Cowan RS (1972a) Francis Galton's contributions to genetics. *J Hist Biol* 5:389–412



- (1972b) Francis Galton's statistical ideas: the influence of eugenics. *ISIS* 63:509–528
- Davis A (1990) Letter to the editor. *Lancet* 1:1406
- Dice RL (1952) Heredity clinics: their value for public service and research. *Am J Hum Genet* 4:1–13
- Dugdale RL (1877) *The Jukes: A study in creme pauperism disease and heredity*. GP Putman's Sons, New York
- Dulbecco RA (1986) A turning point in cancer research: sequencing the human genome. *Science* 231:1055–1056
- Dunn LC (1962) Crosscurrents in the history of human genetics. *Am J Hum Genet* 14:1–13
- Fisher R (1924) The elimination of mental defect. *Eugenics Rev* 16:114–116
- Fost NC, Clayton EW, Grodin MA, Kohrman AF, Nolan K, Wagner VM (1990) Sterilization of women who are mentally handicapped: *Pediatrics* 85:868–872
- Galton F (1865) Hereditary talent and character. Parts I and II. *Macmillan's Magazine* 12(68): 157–166, 318–327
- (1901) The possible improvement of the human breed under existing conditions of law and sentiment. *Nature* 64:659–665
- (1905) Eugenics: its definition, scope and aims. In: *Sociological papers*. Macmillan, London, pp 45–50
- Glass B (1981) A hidden chapter of German eugenics between the two world wars. *Proc Am Philos Soc* 125:357–367
- Haller MH (1963) *Eugenics: hereditarian attitudes in American thought*. Rutgers University Press, New Brunswick, NJ
- Hoffenberg R, Modell B, Alberman ED, Black D, Bobrow M, Harper PS, Milner RDG, et al (1989) Prenatal diagnosis and genetic screening: community and service implications: summary and recommendations of a report of the Royal College of Physicians. *J R Coll Physicians Lond* 23: 215–220
- Hubbard R (1985) Prenatal diagnosis and eugenic ideology. *Wom Stud Int Forum* 8:3567–3576
- (1986) Eugenics and prenatal testing. *Int J Health Serv* 16:227–242
- Kevles DJ (1985) *In the name of eugenics*. Alfred A Knopf, New York
- Kimball MC, Cooper SK (1990) \$60B Medicare cut unnerves Congress. *Healthweek* 4(19): 1, 41
- LaChat MR (1975) Utilitarian reasoning in Nazi medical policy: some preliminary investigations. *Linacre Q* (February), pp 14–37
- Levinsky NG (1990) Age as a criterion for rationing health care. *N Engl J Med* 322:1813–1816
- Lifton RJ (1986) *The Nazi doctors*. Basic, New York
- Lindeman EC, Morgan AE (1936) *American eugenics*. American Eugenics Society, New York
- Ludmerer KM (1969) American geneticists and the eugenics movement: 1905–1935. *J Hist Biol* 2:337–362
- (1972a) *Genetic and American society*. Johns Hopkins University Press, Baltimore and London
- (1972b) Genetics, eugenics, and the immigration restriction act of 1924. *Bull Hist Med* 46:59–81
- McKusick VA (1989) Mapping and sequencing the human genome. *N Engl J Med* 320:910–915
- Mitscherlich A (ed) (1949) *Doctors of infamy: The story of the Nazi medical crimes*. Henry Schuman, New York
- Model B, Kuliev AM (1989) Impact of public health on human genetics. *Clin Genet* 36:286–298
- Motulsky AG (1986) Presidential address: human and medical genetics: past, present and future. In: Vogel F, Sperling K (eds) *Human genetics: proceedings of the seventh international congress, Berlin*. Springer, Berlin, Heidelberg, New York, London, Paris, and Tokyo, pp 3–13
- Muller HJ (1933) The dominance of economics over eugenics. *Sci Mon* 37:40–47
- Müller-Hill B (1988) *Murderous science*. Oxford University Press, Oxford, New York, and Tokyo
- Murphy EA (1975) The normal, eugenics and racial survival. *Johns Hopkins Med J* 136:98–106
- National Research Council (1988) *Mapping and sequencing the human genome*. National Academy, Washington, DC
- Noakes J (1984) Naziism and eugenics: the background to the Nazi sterilization law of 14 July 1933. In: *Ideas into politics: aspects of european history 1880–1950*. Croom Helm, London and Sydney, pp 75–94
- Osborn F (1974) History of the American eugenics society. *Soc Biol* 21:115–126
- Oxford Dictionary of Quotations, The*, 2d ed. (1953) Oxford University Press, London
- Paul D (1984) Eugenics and the left. *J Hist Ideas* (1984): 567–590
- Petchesky RP (1979) Reproducting, ethics and public policy: the federal sterilization regulations. *Hastings Cent Rep* (October), pp 29–41
- Pfaafflin F (1986) The connections between eugenics, sterilization and mass murder in Germany from 1933–1945. *Med Law* 5:1–10
- Poltawska W (1964) *And I am afraid of my dreams*. Hippocrene, New York
- Popkin RH (1974) The philosophical bases of modern racism. *J Operational Psychiatry* 5:24–36
- Proctor RN (1988) *Racial hygiene*. Harvard University Press, Cambridge, MA, and London
- Punnett RC (1917) Eliminating feeble-mindedness. *J Hered* 8:464–465
- Reed SC (1957) The local eugenics society. *Am J Hum Genet* 9:1–8
- Reilly P (1983a) The surgical solution: the writings of activist physicians in the early days of eugenical sterilization. *Perspect Biol Med* 26:637–656
- (1983b) The Virginia racial integrity act revisited: the Plecker-Laughlin correspondence: 1928–1930. *Am J Med Genet* 16:483–492
- (1987) Involuntary sterilization in the United States: a surgical solution. *Q Rev Biol* 62:153–162



- Reitman MJ, Zirin HJ, DeAngelis CJ (1978) Sterilization and the retarded female: is advocacy depriving individuals of their rights? *Pediatrics* 62:850-852
- Relman AS (1990a) Reforming the health care system. *N Engl J Med* 323:991-992
- (1990b) The trouble with rationing. *N Engl J Med* 323:911-913
- Russ AR (1976) Galton and the birth of differential psychology and eugenics: social, political and economic process. *J Hist Behav Sci* 12:47-58
- Sapp J (1983) The struggle for authority in the field of heredity, 1900-1932: new perspectives on the rise of genetics. *J Hist Biol* 16:311-342
- Searle GR (1976) Eugenics and class. *Soc Stud Sci* 6:217-242
- Seidelman WE (1989) In memoriam: medicine's confrontation with evil. *Hastings Cent Rep* 19:5-6
- Sherlock R (1987) Preserving life, public policy and the life not worth living. Loyola University Press, Chicago
- Short EM (1988) Proposed ASHG position on mapping/sequencing the human genome. *Am J Hum Genet* 43:101-102
- Smith JD (1985) *Minds made feeble: the myth and legacy of the Kallikaks*. Pro-Ed, Austin
- Tenenbaum J (1956) *Race and reich: the story of an epoch*. Twayne, New York
- Thielman SB (1985) Psychiatry and social values: the American Psychiatric Association and immigration restriction, 1880-1930. *Psychiatry* 48:299-310
- Tormey JF (1976) Ethical considerations of prenatal genetic diagnosis. *Clin Obstet Gynecol* 19:957-963
- US Department of Health and Human Services, US Department of Energy (1991) *Understanding our genetic inheritance: the U.S. Human Genome Project: the first five years FY 1991-1995*. NIH Publ 90-1590. Washington, DC
- Weindling P (1985) *Weimar eugenics: the Kaiser Wilhelm Institute for Anthropology, Human Heredity and Eugenics in social context*. *Ann Sci* 42:303-318
- (1989) *Health race and German politics: between national unification and Nazism, 1870-1945*. Cambridge University Press, Cambridge
- Weiss SF (1986) *Wilhelm Schallmayer and the logic of German eugenics*. *ISIS* 77:33-46
- (1987) *Race, hygiene and national efficiency*. University of California Press. Berkeley, Los Angeles, and London
- Wilfond B, Fost N (1990) The cystic fibrosis gene: medical and social implications for heterozygote detection. *JAMA* 263:2777-2783