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The social and economic origins of genetic determinism: a case history of the American Eugenics Movement, 1900–1940 and its lessons for today

Garland E. Allen
Department of Biology, Washington University, Campus Box 1137, One Brookings Drive, St. Louis, MO 63130-4899, USA

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Abstract

Eugenics, the attempt to improve the genetic quality of the human species by 'better breeding', developed as a worldwide movement between 1900 and 1940. It was particularly prominent in the United States, Britain and Germany, and in those countries was based on the then-new science of Mendelian genetics. Eugenicists developed research programs to determine the degree to which traits such as Huntington's chorea, blindness, deafness, mental retardation (feeblemindedness), intelligence, alcoholism, szhiophrenia, manic depression, rebelliousness, nomadism, prostitution and feeble-inhibition were genetically determined. Eugenicists were also active in the political arena, lobbying in the United States for immigration restriction and compulsory sterilization laws for those deemed genetically unfit; in Britain they lobbied for incarceration of genetically unfit and in Germany for sterilization and eventually euthanasia. In all these countries one of the major arguments was that of efficiency: that it was inefficient to allow genetic defects to be multiplied and then have to try and deal with the consequences of state care for the offspring. National Socialists called genetically defective individuals 'useless eaters' and argued for sterilization or euthanasia on economic grounds. Similar arguments appeared in the United States and Britain as well. At the present time (1997) much research and publicity is being given to claims about a genetic basis for all the same behaviors (alcoholism, manic depression, etc), again in an economic context – care for people with such diseases is costing too much. There is an important lesson to learn from the past: genetic arguments are put forward to mask the true – social and economic – causes of human behavioral defects.

Introduction

The public has been treated to a blitz in recent years of articles, books, TV and radio reports claiming that many human social and personality traits are largely determined by genes. The popular media has paraded the claim that such 'traits', as alcoholism, manic depression, schizophrenia, shyness, homosexuality, infidelity, and general personality traits, are all significantly determined at the time of conception. In particular, criminality has been center-stage in recent years as one of the major human characteristics for which there is supposed to be a significant genetic basis. Especially important has been publicity of the NIH-US government proposal for an all out 'violence initiative' to seek a biological (meaning largely genetic) as well as a social basis for problems of inner city crime (Allen, in press, 1997). Since the 'Violence Initiative' also received a fair amount of publicity between 1993 and 1995 (it was, in fact, the subject of a special symposium at the AAAS meeting in San Francisco in 1994), I will not say anything more specific about it in this paper. And most recently, of course, the issue of race and IQ has re-emerged and taken center-stage with Richard Herrnstein and Charles Murray's The Bell Curve, published in November, 1994.

Indeed, all of this has been given a big boost by the hype surrounding the Human Genome Project (HGP). The HGP is in fact biology's largest funded project to date and has been billed as the cutting-edge of modern biology in general and molecular genetics in particular. A number of claims, many exaggerated, have

been made in its behalf as a 'magic bullet' for solving a wide variety of human social problems, from alcoholism to shyness, mental disorders and criminality. James D. Watson has been quoted as saying we used to think that our fate was in the stars, but that now we know it's in our genes (Horgan, 1993). More explicitly, Daniel Koshland, in an editorial in *Science* magazine in 1990, claimed that problems of psychiatric disability could in fact be traced to genetic causes, and therefore that the HGP would provide the best means of solving such intractable problems (Koshland, 1990, p. 189). The merits or the lack of merit of the Human Genome Project, however, are not the issue in this paper. What I do want to address is the extent to which many of the current claims for a genetic basis of many social behaviors are coat-tailing, and thus gaining creditability by association with the hype surrounding the Human Genome Project. All of this has lead to a general impression within some segments of the scientific community, and particularly large segments of the general public, that (1) a great deal of new evidence has been obtained demonstrating that many of our social problems are rooted significantly in the defective genetic makeup of some people; and (2) when the Human Genome Project and other associated technologies are completed we will be able to eliminate these problems with the as yet-to-be developed magic bullet of gene therapy.

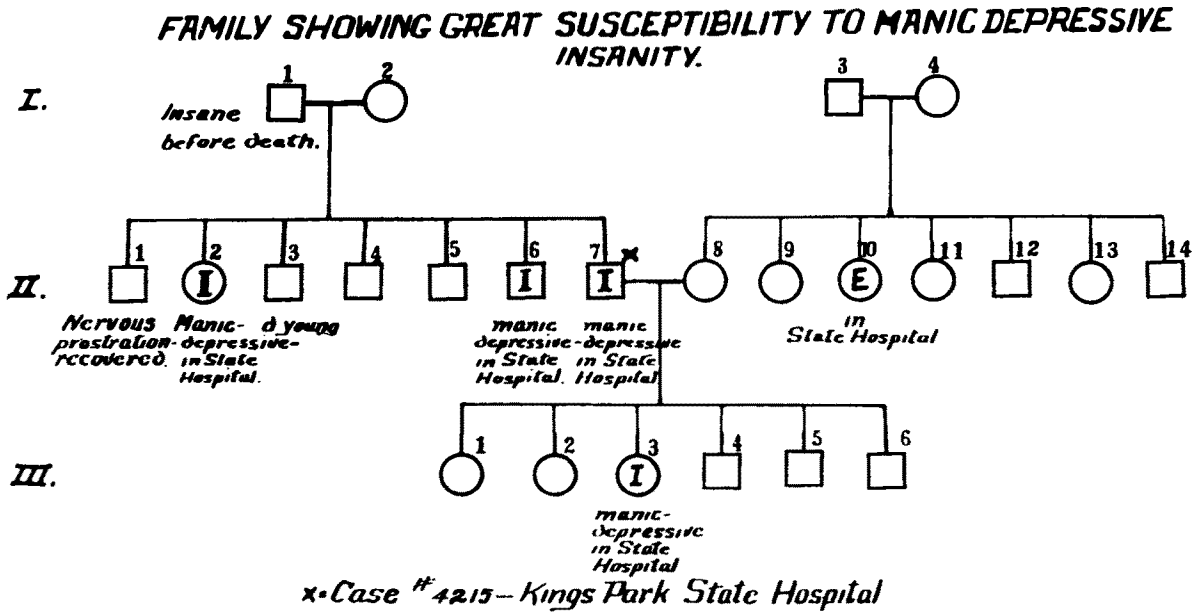
My thesis in the present paper is that this new wave of hereditarian thinking (human behavior genetics as it has been called) grows out of a set of economic and social conditions that are rapidly engulfing us; and that these theories provide a rationalization and justification for the long-range effect of those conditions. Theories of genetic determinism blame the victim for recurrent social problems, while at the same time providing the hope of a quick technical fix (via some promises of 'gene' or at least drug therapy). In short, the most recent batch of so-called scientific claims for a genetic basis of personality is serving an important political function by distracting us – scientists and non-scientists alike – from the social solutions that lie before us. The widespread publicity given to these claims plays a particularly important political role in this regard. But the publicity could not occur without some legitimizing scientific claims to give it credence. These legitimizing scientific claims are generated within segments of the scientific community as the 'basic research' on which popular accounts are based. They form the foundation on which public ideology can be constructed.

I would like to illustrate how such ideas are formed and justified scientifically, as well as how they become a part of public ideology, by considering a specific case from my own research. As an historian of science I have been looking for the last twenty years at what is known as the American eugenics movement, which flourished between the years 1900 and 1940. In particular, I will try to show how the economic and social conditions of that time period fostered the development of eugenic ideas, and what some of the political consequences were. In the end I will try to draw what I think are some important parallels (as well as some differences) between the period 1900–1940 and the present.

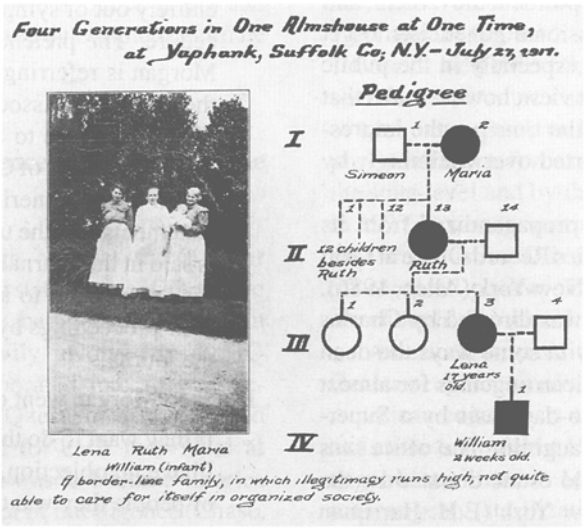
Let me issue several caveats before I begin, just to let you know where I am coming from. I confess that from my experience as both an historian and someone who writes a great deal about current work in genetics, I am skeptical, I would even say biased, about claims of a genetic basis for any specific social behaviors such as criminality, schizophrenia, homosexuality, etc. History shows that while many such claims have been made in the past, virtually none have held up to close scrutiny. Other contributors to this volume of *Genetica* will discuss the many methodological problems involved with research on human behavior genetics, but it is important to my point to emphasize that the scientific claims themselves have always been, and are still, highly disputed. However, as an historian of science my major focus is more on the way such ideas have been generalized within the scientific community and disseminated to the general public, that is, how they have become popularized and enter into the halls of received knowledge. By way of illustration, then, let me turn to the claims made in the name of eugenics, earlier in the twentieth century.

The early development of the American Eugenics Movement

The term eugenics was originally coined by Darwin's cousin Francis Galton (1822–1911) in 1883 to mean 'truly' or 'purely' born (Galton, 1883). It was redefined by Galton's American disciple Charles B. Davenport (1866–1944) as 'the science of the improvement of the human race by better breeding' (Davenport, 1910). Eugenic theory was based on a belief in the genetic inheritance of a large number of social traits. At that time 'genetic' meant largely Mendelian heredity where very complex traits were thought to be governed by one or two genes. The solution to social problems,



(a)



(b)

Figure 1. (a) Family pedigree for 'Manic Depressive Insanity'. (Slide prepared by Harry H. Laughlin on the Eugenics Record Office, from data in a New York State hospital [Kings Park], c 1920; from H.H. Laughlin Papers, Northeast Missouri State University, Kirksville). (b) Pedigree of 'Pauperism' (From Marion S. Norton, Selective Sterilization in Primer Form [Princeton, NJ]).

then, lay in regulating what Mendelian genes were passed on to successive generations. The social traits that were identified by eugenicists as being genetically determined were criminality, manic depressive insanity, pauperism, racial differences, and various forms of mental ability including 'inherited scholarship', and its converse, feeblemindedness (Figure 1). Eugenicists developed two specific aspects of their work: (1) a research program in which they sought to determine the patterns of inheritance exhibited by various of these traits (were they dominant or recessive, sex-linked, etc), and (2) a social action program in which they sought to educate the public about eugenic issues and to enact social legislation (laws limiting reproduction for certain individuals claimed to be genetically 'defective').

On what sort of evidence were these eugenic-claims based, and how did they hold up over time? Eugenic claims, especially in the United States, rode high on the wave of excitement following the rediscovery in 1900 of Mendel's work on particulate inheritance. The basic theory of eugenics was encapsulated in Davenport's authoritative claim that 'new evidence shows that most social traits are determined by Mendelian genes' (Davenport, 1915). To varying degrees this idea was held by a large number of both biologists and lay persons. But there was moderate criticism within the scientific community. For example, in 1924 Herbert Spencer Jennings, a protozoan geneticist at Johns Hopkins, published a number of criticisms of the scientific claims for eugenics, as did his Hopkins colleague Raymond Pearl in 1927 and the geneticist H.J. Muller in 1932. But by and large most members of the scientific (biology) community did not speak up publicly, either at meetings or in print, about the tenuous and often-exaggerated claims of eugenicists. Many thought it was largely a political movement, and that it did not behoove professional geneticists to get involved in political debates, especially in the public press. The consequence of that view, however, was that the general reading public at the time got the impression that eugenics was supported overwhelmingly by many scientists.

Eugenics in the US was propagandized from its institutional base at the Eugenics Record Office at Cold Spring Harbor (Long Island), New York (Allen, 1986). The Eugenics Record Office was directed by Charles B. Davenport, who was really in some ways the dean or the leading figure of American eugenics for almost 30 years, and run on a day-to-day basis by a Superintendent, Harry Hamilton Laughlin. The office was housed in a building on an old estate donated by the E.H. Harriman family of New York (E.H. Harriman was founder of Union Pacific Railroad) to Davenport in 1910. The Eugenics Record Office was not operated by people on the scientific fringe. In fact, the scientific advisory board in 1912 consisted of a number of eminent scientists: Davenport himself; Irving Fisher, a political economist from Yale and for many years the secretary of the American Eugenics Society; William E. Castle, mammalian geneticist at Harvard; Adolf Meyer, embryologist at Johns Hopkins; J. Arthur Thompson, popular lecturer and writer at the University of Aberdeen (Scotland) and inventor Alexander Graham Bell. This group represented mainstream biology in its day. It was not initially regarded as something akin to astrology or phrenology. Those biologists that did object to some eugenic claims tended to do so quietly and did not attempt to make a public issue. For example, Although T.H. Morgan, doyen of *Drosophila* genetics at Columbia University, supported the aims of the eugenics movement for a brief period, by 1915 he had lost sympathy with it (Allen, 1978). In January of that year he wrote to C.B. Davenport resigning from the committee on Animal Breeding of the American Genetics Association because of the 'unsubstantiated' and 'reckless' use of genetics to support social and political conclusions:

> Dear Davenport;
>
> I have just written to Mr. Popenoe [Paul Popenoe, editor of the Journal of Heredity, then one of the major organs for publishing eugenic research], resigning from the Committee on Animal Breeding [of the American Breeder's Association, one of the early eugenics organizations]. I am sending you just a line to give a further explanation of why I have done so. For some time I have been entirely out of sympathy with their method of procedure. The pretentious title, for one thing [here Morgan is referring to the eugenics committee of the Breeder's Association, which had been titled 'The committee to Study and Report on the Best Practical Means of Cutting off the Defective Germplasm in the American Population'], the reckless statements and the unreliability of a good deal that is said in the Journal, are perhaps sufficient reasons for not wishing to appear as an active member of their proceedings by having one's name appear on the journal.

But then Morgan went on to say:

> If they want to do this sort of thing, well and good; I have no objection. It may be they reach the kind of people they want to in this way, but I think it is just as well for some of us to set a better standard, and not appear as participators in the show. I have no desire to make any fuss, or to discuss the matter; but personally I would rather be out of it and remain a simple member of the Association, for the sake of the Journal' (Allen, 1978).

Morgan took what was for him a principled stand on this issue; he saw the prejudice and lack of scientific evidence rampant in eugenics claims, and he disassociated himself from it. It was consistent with his desire to avoid unnecessary controversy and to separate science from politics that he took the stand he did. However, Morgan made no public statements so that, as far as the educated but non-scientist reader was concerned,

eugenics appears to have been accepted by most of the scientific community. The voices of dissent were neither loud nor publicly expressed.

Eugenics was highly popularized in the media of the day and even movies between 1910 and 1930. There were popular articles written in all the major magazines such as Saturday Evening Post, Popular Science Monthly, Good Housekeeping, The American Mercury, etc. There were at least 20–30 popular books published on eugenics in this period, and numerous exhibits that traveled around to state fairs, the American Museum of Natural History and even in the Capitol rotunda in Washington during the period of the immigration debates following World War I (Hassencahl, 1970). There was a widely-shown eugenics feature film released in 1915, The Black Stork, based on a true story in which a Chicago doctor persuaded the parents of a seriously malformed infant to allow the child to die (Pernick, 1996). With all of this publicity, it would have been difficult for any moderately well-read person at the time not to have known about eugenics and not to have thought it represented a new and legitimate area of modern biology.

Political and social consequences of eugenics in the United States

Eugenic influence surfaced in at least three major political arenas during the first four decades of the 20th century. From the very beginning (starting in 1912), eugenicists were heavily involved in the IQ testing movement and incorporated into that movement a hereditarian view that IQ tests measured a fixed quantity that was determined for each individual at the time of conception – what was to become Charles Spearman's g, the general factor of intelligence (Chase, 1977; Gould, 1996; Kamin, 1974). Eugenicists were also involved in lobbying for passage of the Johnson, or Immigration Restriction Act of 1924, the first immigration quotas ever placed on countries in Western Europe. To that end, in 1921 Harry Hamilton Laughlin, Superintendent of the Eugenics Record Office, was appointed the Eugenics Expert Witness to the House Committee on Immigration and Naturalization in 1921, a position he held for a decade. Between 1921 and 1924, he testified three times before the Committee, arguing that the 'new' immigrants from non-Anglo-Saxon countries such as Poland, Hungary, the Balkans, Turkey, Italy, and Russia (the USSR at the time) were genetically inferior to the old native American stock and were, by continual assimilation and intermarriage 'polluting' the blood stream of America (Laughlin, 1923; Ludmerer, 1972). Although immigration restriction would probably have passed anyway (for economic reasons) eugenical arguments gave crude nationalism and nativism a rational scientific gloss that obscured basic fear and prejudice.

Laughlin and other eugenicists were also heavily involved in the passage of state eugenic sterilization laws. Between 1910 and 1935 Laughlin wrote up what became known as the 'model sterilization law' that was used, in modified form, by a number of states (Reilly, 1991). Through contacts with influential members of local chapters of the American Eugenics Society (AES), Laughlin and other eugenicists lobbied in a number of state legislatures on behalf of compulsory sterilization laws for institutionalized individuals deemed to be 'genetically inferior'. In virtually all cases, it was claimed that sterilization of genetic defectives now would save millions of dollars in the future (Figure 2). By 1935 over 30 states had passed such laws. Well over 21,000 such sterilizations had taken place by 1935 and well over 60,000 by the 1960s (Paul, 1974; see Note). A court challenge to the constitutionality of such laws, Buck vs Bell in Virginia, was staged by pro-sterilization forces in 1925. The law was upheld at the state level and by the US Supreme court on appeal in 1927. It was in writing his majority opinion on this case that Justice Oliver Wendell Holmes coined the oft-repeated phrase 'Three generations of imbeciles are enough' (Lombardo, 1985).

American eugenicists were also enamored of the German eugenics movement in the 1930s. A number of American eugenicists visited Germany after the Nazis had come to power in 1933, to examine the progress of eugenic sterilization and the proceedings of the German eugenic sterilization courts. Frederick Osborn, a major leader of the American eugenics movement, praised the Nazi sterilization program as 'the most important experiment in eugenics that has ever been tried', and Harry Laughlin of the Eugenics Record Office received an honorary doctor of medicine degree from Heidelberg University in 1936 (on the occasion of its 550th anniversary) for 'work toward preservation of the purity of the germ plasm'. Meanwhile, Davenport, a Harvard alumnus, arranged for a group of German eugenicists to be invited to Harvard's own 300th anniversary celebration later that same year.

In an era before big government support of science, eugenics was funded generously by some of the largest private philanthropies of its day: the Carnegie

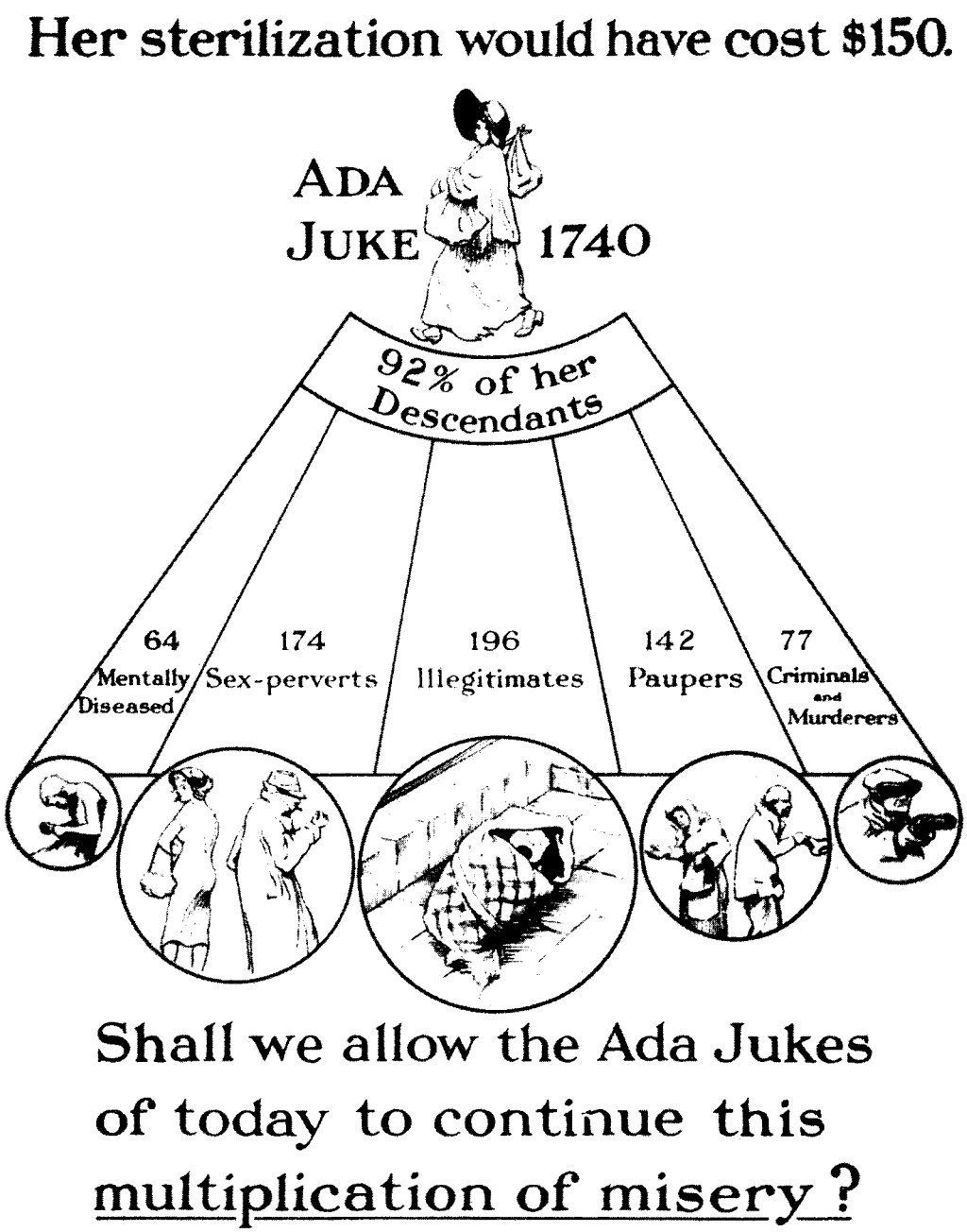


Figure 2. The argument for selective sterilization was based largely on economic grounds, as shown by the 'cartoon' from Marion S. Norton, *Selective Sterilization in Primer Form*, published by the Sterilization League of New Jersey (October, 1937).

Institution of Washington, the Rockefeller Foundation (and John D. Rockefeller I personally), The Race Betterment Foundation founded by the Kellogg family of Battlecreek, MI, and the Harriman family of New York. The Eugenics Record Office alone between 1910 and 1940 received support from the Harriman and Carnegie philanthropies amounting to $1,217,000 (a fairly large contribution for that day). The figure does not include a broad range of other personal donations of lesser size, nor funding of hundreds of other institutions, organizations, exhibits, and activities at the state and local level (Allen, 1986).

The economic, social and political milieu of eugenics

The question I would like to address in the final part of this paper is: What were the economic and social conditions in the United States that fostered the rise of eugenics in such a prominent way? The period in which eugenics flourished, 1910–1940, was one of great economic and social turbulence. It was associated with the shift from agricultural and rural society to an industrial and urban society. This was itself associated with great fluctuations in unemployment, income, productivity, and a host of related social and political problems. It was also associated with a number of periodic recessions, depressions, some of even greater extreme than the 'Great Depression' of 1929–1935. Along with economic and social instability this period was also one of great industrial conflict, and has sometimes called the age of industrial warfare, associated with union and trade union organizing, increasing numbers of strikes and work stoppages, and confrontational and often armed conflict (Adams, 1966; Lens, 1973). Although only partly true, the public was given the distinct impression that much of the conflict was being stirred up by immigrant organizers who had infiltrated the American work force and who were bringing 'foreign and disruptive ways' into a basically peaceful laboring class (this image is graphically demonstrated in the cartoon shown in Figure 3). In short, during the period 1890–1935, American capitalism was in trouble. There was a lack of access to foreign markets due to long-standing isolationist policy, which meant limited opportunities for expansion of capital abroad. At the same time, the continual demand for higher wages engendered by the trade union movement was cutting heavily into profits, while large trusts were monopolizing flow and concentration of capital, leading to a decrease in the amount of money in circulation.

The response to these conditions by America's ruling economic and political leaders was to move away from laissez-faire ideology towards a more planned and regulated economy. This period has become known by historians as the 'Progressive Era', largely a self-styled name meant to indicate the anti-laissez faire position of the new movement (Wiebe, 1967). It is beyond the scope of this paper to describe in any detail the character of the progressive movement, but a few of its most central tenets will suggest how closely eugenic thinking managed to fit in with progressive philosophy. On the one hand, progressivism supported the ideology of scientific planning and management, that is, the new complex economics and other social developments could not be left simply to laissez-faire practices. Scientific planning involved a number of new practices, particularly the introduction of scientifically-trained experts and managers into the workplace and government, individuals who had technical expertise in specific areas such as economics, industrial psychology, or social planning. The aim of scientific management was to bring everything from the factory floor and production line to legislation regarding unions, monopolies, interstate commerce, food and drug sales and the like under rational planning and control. This was the era introducing for the first time large-scale government regulation: The Interstate Commerce Commission (organized between 1887–1906), The Sherman Anti-Trust Act (1890), Pure Food and Drug Act (1906), and the Federal trade commission (1914), among others. In all of this legislation, the emphasis was on the use of scientifically (meaning, technically) trained experts who could micromanage in a controlled and predictive way within their own areas of expertise. Eugenics fit perfectly into this mold. It was a paragon of rational scientific planning applied to the management of the most hitherto unregulated aspect of human life, the reproductive process itself. Eugenics was dedicated to the preservation of the most important of all human resources, the germ plasm of future generations. Eugenics was thus based on the knowledge of a special class of experts, those trained in reproductive biology and genetics. It was rational planning par excellence.

A second aspect of progressivism that fit very well with eugenic ideology was that of the cult of efficiency. According to progressivist thinking, it was inefficient to let major social or economic problems develop and then have to deal with the consequences at a later time.

Plain Remarks on Immigration for Plain Americans

By KENNETH L. ROBERTS

Figure 3. Immigrant 'troublemaker' confronting an innocent-looking American worker with a bottle (molotov-cocktail) labelled 'Strike'. Other bottles in the immigrant's suitcase are labelled 'Discontent,' 'Labor Trouble,' and 'Strife.' Note the flag on the immigrant's hat contains the word 'Red', referring to Communists. The watchful US Immigration Service officer is lurking in the background to apprehend the trouble-maker. This cartoon accompanied an article by rabid anti-immigrationist Kenneth L. Roberts published in the *Saturday Evening Post* of February 12, 1921].

In eugenic terms, this suggested that: if traits such as crime, pauperism, feeblemindedness, prostitution and rebelliousness were produced by defective genes, then the efficient solution would be to prevent such genes from being transmitted to future generations. Thus, would it not have been better if Ada Juke could have been sterilized in 1740 to prevent the production of numerous generations of defectives, than for the state to pick up the tab for the numerous generations of defectives she produced ever since (see Figure 2)? In her insightful study of the history of eugenic ideology in Germany, historian Sheila Weiss has pointed out that one of the most important components of Nazi ideology was the view that society had to be made more efficient (Weiss, 1990). The same could be said of the ideological bias of American eugenics. In both cases, individual human beings, or even special (ethnic/racial) groups were viewed exclusively in terms of their economic productivity – their 'bottom-line' contribution to society. Nazis developed the term 'lives not worth living' or 'useless eaters' to refer to those who consumed but did not produce. It is a sad commentary on any society that comes to regard its own citizens, especially its weakest and most helpless members, as a drain on national efficiency.

I would like to suggest that in the United States, immersed as we are in the present economic era of cutbacks and 'bottom line' mentality, we are on the brink of revisiting a mistake of the past, that is, regarding certain people as too expensive to maintain, and using genetic arguments to justify inhumane solutions in the name of efficiency. At the present these 'solutions' may involve only feeding people Prozac or Ritalin rather than paying them higher wages or providing them with adequate health benefits; but the chilling reality we have to face is that the Nazi emphasis on elimination

of genetic defectives was based on the same line of argument, the same 'logic' of efficiency.

Why, then, did the efficiency argument lead to such drastic results in Germany compared to the US or elsewhere? Conditions in Germany between the wars were considerably more stringent than in the US then or today. Restrictions imposed on Germany by the Treaty of Versailles, enormous public and private pre- and post-war debt, the loss of overseas colonies and of the iron- and coal-rich regions of the Rhineland, and heavy reparations payments all converged to heighten the already existing problems of prewar inflation, unemployment, and the growing strength of organized labor especially in the north. In 1919 Germany experienced a series of general strikes and socialist-led provisional take-overs of local governments that threatened to equal or surpass the Bolshevik revolution in Russia in 1917. In the eyes of many of Germany's business and governmental leaders, the persistence of general strikes and immense loss of morale made Germany a more-than-likely candidate for another communist assumption of state power.

In the face of such upheaval, the newly established Weimar Republic, without a Kaiser and modeled on British-style parliamentary rule, was virtually impotent. During its 15-year reign the Weimar government seemed increasingly unable to take the necessary strong steps to bring Germany's flagging economy under control. On top of an already intolerable situation, the stock market crash of 1929 hit a vulnerable Germany perhaps hardest of all. Tough management was the order of the day, and if the fascists stood for nothing else, it was strong-arm control.

Facing drastic state budget cuts, the newly installed Nazi government viewed 'wards of the state' as both costly and expendable and thus took eugenics to its 'logical' end: sterilization and genocide. In fact, during the whole of the Nazi period, it has been estimated that upwards of 400,000 institutionalized persons were involuntarily sterilized; the majority of these were during the first four years of the sterilization law's existence (1933–1937). In some areas, such as the state of Baden-Wurttemberg, more than 1 percent of the entire population was sterilized. However, as the war effort accelerated and resources became tighter, 'euthanasia' was increasingly substituted for sterilization (Burleigh, 1994).

Sheila Weiss has emphasized recently that from the efficiency standpoint, a racial policy such as the euthanasia program is not without its logic, as morally perverse as that logic may appear. 'Throughout its history, race hygiene was a strategy aimed at boosting national efficiency through the rational management of population', she says. 'Although the extermination of millions of European Jews cannot really be viewed as a measure designed to boost national efficiency, the interpretation of the Jews as an unfit, surplus, and disposable group is not unrelated to the emphasis implicit in German race hygiene regarding 'valuable' and 'valueless' people. Hence, when all is said and done, it is the logic of eugenics far more than its racism that proved to be the most unfortunate legacy of the Germany race hygiene movement for the Third Reich (Weiss, 1990, p. 49).

The advent of eugenic solutions in both Germany and the US in the 1920s and 1930s shows that under varieties of emotional and financial duress, ordinary individuals, not just misguided or demagogic political figures, can succumb to the logic of what can be seen in a calmer light as an abhorrent policy. Indeed, according to Oxford historian Michael Burleigh, many individual families hardest hit by economic conditions in Germany were sometimes 'relieved' to have their mentally ill or dependent relatives committed to institutions, sterilized, or even subjected to euthanasia, rather than persist in the expensive and emotionally draining experience of maintaining them in home care.

Out of all this, the question that we face today is how close are we to embracing a modern form of eugenics? Will we in the United States someday rewalk those paths of trying to solve our social problems with scientific panaceas? I am sorry to say that I think the answer may be yes. A new eugenics movement would, of course, be called by a different name, but an era of similar economic and social conditions and a similar political response – for example, embodied in our current philosophy of 'cost-effectiveness' and 'the bottom line' – has already arrived. Witness the decline in our economic and social conditions in the past two decades as an indicator of our potential to find eugenical arguments (clothed in the updated language of molecular genetics) attractive once again: Average weekly earnings have fallen 16 percent since 1973, and median income of families with children (under 18) has declined 32 percent. Meanwhile, the top 1 percent of the population controls almost 48 percent of household wealth and income, while the top 20 percent controls 94 percent. Unemployment has hovered at the 5 to 7 percent figure for the past four years, and analysts complain that these figures fail to include a whole category of 'underemployed' (part-time, occasional) workers,

or those who have simply given up on the job market and no longer report to unemployment offices.

A parallel between the economic and social milieu of the United States today and that of Germany in the Weimar and especially Nazi periods emerges in the debates over health care. Then as now, the discussions centered on decisions about who should receive what kind of health care and for how long. Indeed, in Germany medicine was considered a national resource to be used only for those individuals who showed the greatest prospect of recovery and future productivity.

In the 'cutback' atmosphere that dominates our discussions of a wide variety of social policies today, the mood seems similarly exclusionary and bitter. For example: legislation that proposed to limit welfare recipients to five years, or even two years over a lifetime; the suggestion that welfare mothers with more than two children be given Norplant (an antifertility drug); the idea of 'three strikes and you're out' (three convictions mean a life sentence with no parole), and increasing calls for the death penalty – all run a striking parallel to the mood of late Weimar and Nazi Germany that called for reduction of rations for, and later elimination of, the aged, those with terminal diseases, repeat offenders, and the mentally impaired. Such extreme measures were justified in Germany by the policy of efficiency and scarcity of resources. Our current focus on 'tough love' may be just a euphemism for what may somewhere down the road become 'lives not worth living'.

It is important not to underestimate the degree to which economic and social stress can lower our sensitivity to each other and to moral and ethical values. To a family already hard hit by pay cuts, increased workload, rising costs of living and reduction in benefits, the use of tax dollars to maintain what is portrayed as a large population of dependent, nonproductive citizens is not likely to engender much sympathy. Witness the success of California's Proposition 187, which denies public services – health care and schooling, for example – to 'illegal aliens'.

If we are willing to contemplate severely restricting public assistance now, leaving a whole segment of the population to live at less-than-subsistence levels, is it too far a step to consider such people 'expendable'? Historian of science Diane Paul of the University of Massachusetts puts it succinctly: 'One clear lesson from the history of eugenics is this: what may be unthinkable when times are flush may come to seem only good common sense when they are not. In the 1920s, most geneticists found the idea of compulsory sterilization repugnant. In the midst of the Depression, they no longer did . . . . Over time, noble sentiments came increasingly to clash with economic demands. Charitable impulses gave way to utilitarian practices'.

I do not want to sound alarmist. We are not, after all, in anything like the severe stage of economic decline Weimar Germany experienced in the 1920s. But it would also be foolish to look in the other direction and not anticipate how we might respond if we found ourselves in such dire straits. Contemplating our potential for accepting fascist solutions is particularly important at a time when it might be possible to alter our course.

However, genetic determinism is becoming as rampant today in both scientific and lay circles as it was in Weimar Germany in the 1920s. The United States government (particularly the NIH) and several private foundations (most notably, the Pioneer Fund) have devoted considerable resources to research on the genetic basis of many such traits (Mehler, 1994). For example, the National Institute of Alcoholism and Alcohol Abuse has allocated $25 million for research on the genetic origins of alcoholism. The National Institute of Mental Health has awarded even larger sums for the study of the genetics of schizophrenia and manic depression. Three years ago, several government agencies (the NIH, the Centers for Disease Control, CDC, under the auspices of the National Academy of Sciences) teamed up and proposed bringing much of the research on the social and biological basis of criminal/violent behavior under the umbrella of a $400 million 'Violence Initiative' program that would focus particularly on the biological basis of violence in inner-city youth (Allen, 1997). Should the 'Violence Initiative', or any significant part of it get the green light, we could be closer than we ever have been to a Nazi-type solution.

Meanwhile, the publicity given to each new or preliminary report on the genetics of human behavioral traits has grown even faster than the research itself. Every major popular magazine – Time, Newsweek, US News and World Report, and the Atlantic Monthly, to name only a few – as well as most major newspapers have carried stories about the newest discovery of a gene for a given disease or trait. Moreover, all the accounts have been presented against the backdrop of the Human Genome Project, whose legitimate discoveries about the location of DNA segments for such clinical conditions as Huntington's disease and cystic fibrosis have lent an aura of authenticity and prestige to the general field of human genetics that further vali-

dates the more hyperbolic popular reports about genes for personality.

What can we do to prevent a resurgence of a Nazi-like mentality? One of the most important weapons we have is the knowledge that Nazism did occur once already in recent history. Our understanding of that experience can provide powerful lessons, if we are willing to learn from them, about how simplistic science can be perverted to socially destructive ends.

Another advantage we have at the moment is experience, both in the scientific and lay communities, showing that open opposition to genetic determinist ideas can affect the degree to which they are accepted. Geneticists and other biologists did not stand up publicly to oppose eugenical claims in the 1920s and 1930s the way some of the counterparts have done in the recent past. The NIH Violence Initiative might have moved into place unnoticed had not Maryland psychiatrist Peter Breggin, who is head of the Center for the Study of Psychiatry and Psychology in Bethesda, Md., made a cause celebré of the Institute's proposal to study the biological basis of violence in inner-city youth. The claims of Arthur Jensen, Richard Herrnstein, and William Shockley 20 years ago about a genetic basis for racial difference in IQ might have become quietly incorporated into mainstream biology, sociology, psychology, and educational theory had not the scientific claims been disputed publicly by knowledgeable geneticists such as Richard Lewontin and psychologists such as Leon Kamin.

We also have a far more sophisticated understanding of genetics today than did our counterparts in the 1920s and 1930s. While this knowledge does not guarantee that simplistic claims of a genetic basis for our social behavior will not be put forward, it does mean we can counter such arguments with modern facts. Indeed, researchers have had great difficulty establishing any satisfactory claim that specific genes cause complex human social behaviors. Virtually none of the studies claiming such links have been duplicated by independent researchers. Many have been withdrawn after the first flurry of excitement surrounding their publication in professional journals. Indeed, a Scientific American article a few years ago labeled a table surveying some of the modern theories of genetic determinism 'Lack of Progress Report' (Horgan, 1993, p. 125).

One reason for the difficulty in verifying such claims is that the process by which embryonic development occurs suggests that genes are not rigid bits of information that invariably lead to the same outcome. Changes in the chemical, physical, and biological environment of cells in embryos can turn genes on or off or change their degree of expression at critical periods in the developmental process. In this respect, the genes affecting human behavioral and personality traits, the most plastic of our phenotypes to begin with, are the most influenced by environmental input.

The fact that today's researchers have had no greater success in rigorously establishing the genetic basis for social behaviors than did their counterparts 70 or 80 years ago suggests that the whole question is biologically misconstrued. Although simplistic claims are still being, and probably will continue to be, made, trying to sort out how much genes as opposed to environment shape human behavior is about as meaningful as asking whether flour or yeast contribute most of the taste of a cake. Of course, it is possible to determine the effects of eliminating yeast by doing the appropriate experiment. But this is exactly what we cannot – hopefully what we are unwilling – to do with ourselves and our children; it would take rigorously controlled, multigenerational experiments to begin to tease apart the relative contributions of heredity and environment in the complex interactions that lead to specialized behavioral traits. If the environment cannot be controlled – if we cannot know clearly what influences acted with what intensities at all periods of development – then we have no real way of determining the relative influence of heredity and environment in the interaction.

Another significant problem with this entire area of research is that the very definitions of most of the behaviors that are being studied today are highly subjective . What is a 'criminal' or 'violent' act? What is alcoholism? We can make up arbitrary definitions for legal, psychiatric, or clinical purposes, but this does not mean we are dealing with behaviors that have the same causal roots, either biologically or sociologically. If researchers cannot agree on the nature or definition of a trait, they have little hope of rigorously studying its genetics. Only by exposing the flaws of naive genetic determinism, while also attending to the basic problems in our economic and social system, can we avoid repeating the worst errors of our predecessors.

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Note

The figure for total legal, eugenic sterilizations in the U.S. between 1907 and 1963 is given as 64,000 by Julius Paul (1974, chapter 3). This figure is a compilation of the cumulative sterilization in those states that had passed such laws during that time period. By 1940, over 35 states in the U.S. had passed such laws, and at least one (West Virginia) passed a law after World War II. These state laws allowed for involuntary sterilization. Up to the mid-1930s, California was the state performing the largest number of sterilizations (12,000 as of 1935 out of a total for all other states of 21,000+). State-by-state figures are available in Philip R. Reilly, The Surgical Solution: A History of Involuntary Sterilization in the United States (Baltimore, Johns Hopkins Univ. Press, 1991), esp. Chapter 7, 'Sterilization Data'. Reilly does not, however give cumulative figures past the World War II period. In her review of Reilly's book [Journal of the History of Biology, 1992: 164–167] Diane B. Paul quotes the total figure of 60,000 (p. 165), but I do not know where she got this figure. Similarly, it should be pointed out that Julius Paul (no relation to Diane!) in the above chapter does not cite a source for his figure of 64,000 total sterilizations. There are indirect ways to tally up these totals (looking at data state-by-state and adding up the numbers year-by-year, but I am convinced the figure of 60,000–64,000 is probably low, since figures for actual sterilizations performed are likely to be more under-reported than over-reported. In addition, for data before 1932 a contemporary publication, Human Sterilization by J.H. Landman (New York, Macmillan, 1932) is useful.