

Science and Politics: Global Warming and Eugenics

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The issue of global warming has been one of the more confusing and misleading issues to be presented to the public. Despite the absence of a significant scientific basis for most predictions, the public has been led to believe that there is an overwhelming scientific consensus that the issue is a matter of immediate urgency requiring massive control of energy usage. The first part of this paper will briefly describe this situation. The thought that scientists would allow such an abuse of science is difficult for most laymen to believe. However, I suggest that what is happening may, in fact, be the normal behavior to be expected from the interaction of science, advocacy groups, and politics. A study of an earlier example of such an interaction, the interaction of genetics, eugenics and immigration law during the early part of this century, reveals almost analogous behavior.

Global Warming as a Public Issue

Temperature change v. warming

Global warming, as a public issue, is a semantic quagmire. First there is confusion over the use of the expression ‘global warming.’ At times, the expression is used to refer to observed global temperature change. Here there is widespread agreement that the globally averaged temperature of the earth has increased somewhere between 0.3 and 0.6C over the past century, with a small but significant chance that the actual record might be outside this range. The change is also widely agreed to be within the range of natural variability¹. Because of the existence of natural variability,

¹ There has recently been a good deal of publicity over the claim that warming over the past century exceeds natural variability, and thus *some* of it may be due to anthropogenic carbon dioxide (Stevens, “Experts confirm human role in global warming,” *New York Times*, Sept. 10, 1995, page 1). This weak claim, unfortunately, is based on the assumption that variability in models is the same as variability in nature. This is not widely believed. Although the scientific statement of this proposition included a caveat, Stevens’ article did not. Stevens used as the basis for his article a draft of the 1995 report of the Intergovernmental Panel on Climate Change (IPCC) which is still in review. Based on this draft, Stevens claimed a ‘consensus’ for the new view; a claim vigorously endorsed by Michael Oppenheimer of the Environmental Defense Fund. What was remarkable about this claim was that it was accompanied by an admission that hitherto almost all climate scientists “refused to declare publicly that they can discern the signature of the greenhouse effect.” Oddly

it is possible to say that the observed record is ‘broadly consistent’ with models predicting significant warming from the emissions of CO₂ resulting from mans activities. However, the observations are comparably consistent with models predicting a small amount of cooling. It is also known that there is poor correlation between regionally averaged temperatures (which are what will affect actual people) and globally averaged temperature. I have no argument with this view of global warming. At other times, the expression ‘global warming’ is used in the active sense to refer to warming that might be due to increasing levels of CO₂ in the atmosphere. This is the issue concerning which there has been widespread argument for almost a century. There are many reasons to question the hypothesis. Some basic arguments run as follows²:

1. The basic greenhouse process is not simple. In particular, it is not simply a matter of the gases which absorb heat radiation (greenhouse gases) keeping the earth warm. If it were, the natural greenhouse would be about 4 times more effective than it actually is. In reality, the surface of the earth is cooled by evaporation and motion systems which bodily carry heat both upwards and polewards, thus bypassing much of the atmosphere’s greenhouse absorption. The actual greenhouse effect depends on these motions as well as the greenhouse gas concentrations above the levels where motions deposit heat and the details of the temperature distribution at these levels. All of these are matters of significant basic uncertainty, and involve errors in model behavior so large as to be discerned even in the uncertain data.
2. The most important greenhouse gas in the atmosphere is water vapor, and percentage changes in this gas are comparably important at all levels of the atmosphere (at least below 16 km) despite the fact that the concentration of water vapor is thousands of times less at 16 km than at the surface. Roughly speaking, changes in relative humidity on the order of 1.3-4% are equivalent to the effect of doubling CO₂. Our measurement uncertainty for trends in water vapor is in excess of 10%, and once again, model errors are known to substantially exceed measurement errors in a very systematic way.
3. The direct impact of doubling CO₂ on the earth’s temperature is rather small: on the order of 0.3C (The February 1995 issue of *Physics Today* has an exchange of correspondence on this matter). Larger predictions depend on positive feedbacks, primarily from upper atmosphere temperature and from water vapor, acting in such a manner as to greatly magnify the effect of CO₂. Both these factors arise from models with errors in these factors, the importance of which greatly exceed the effect of doubling CO₂.

enough, the scientists quoted continued to refuse.

² A general review to the physics of climate may be found in Lindzen, R.S., 1993: Climate dynamics and global change. *Ann. Rev. Fl. Mech.*, **26**, 353-378.

There is very little argument about the above points. They are, for the most part, textbook material, showing that there are errors and uncertainties in physical processes central to model predictions that are an order of magnitude greater than the climate forcing due to a putative doubling of CO₂. There is, nonetheless, argument over whether the above points mean that the predicted *significant* response to increased CO₂ is without meaningful basis. Here there is disagreement. Major users and developers of large models frequently defend model results regardless of the above. Theoreticians and data analysts are commonly more skeptical. The word, *significant*, should be emphasized. Global mean temperatures fluctuate by 0.25C and more without anyone particularly noticing. It seems most peculiar that such disagreements should be described in terms of contrarians and consensu. In order to understand this, one must turn to the next source of semantic confusion: namely the difference between a natural consensus arising in a field and a forged consensus. It should be added that there is a substantial body of both theoretical and observational analysis that strongly suggests that the models have substantially exaggerated the impact of increasing CO₂. However, for present purposes it suffices to note that there is neither an observational basis for concerns nor a credible theoretical basis. Support for the popularly stated scenarios are, at this point, little more than statements of belief rather than science.

Natural v. forged consensus

The consensus concerning the behavior of the observed globally averaged temperature is pretty much a natural consensus. The consensus concerning the model response to increasing CO₂ is not. The issue is described by Boehmer-Christiansen in both the 1 December issue of *Nature*³ and in a book-length analysis. Briefly, a number of groups in the early 80's wanted to push increasing levels of CO₂ as a major environmental issue. However, it was recognized that this would be difficult to do in view of the degree of scientific disarray on the issue of anthropogenic global warming. The Intergovernmental Panel on Climate Change (IPCC) was created in order to forge a consensus on the scenario of significant warming (rather than to objectively assess the issue in terms of supporting and contradictory findings) so as to facilitate the development of international policy. Even so, such consensus as was forged was largely restricted to the Policymakers Summaries of the IPCC documents rather than the detailed texts. Moreover, the extent of the claimed consensus has steadily diminished in IPCC documents as one goes from the 1990 report through the 1992 update, to the 1994 report on warming potentials, and to the forthcoming 1995 report⁴. Clearly, the rapidity

³ Boehmer-Christiansen, S.A., 1994. A scientific agenda for climate policy? *Nature*, **372**, 400-402.

⁴ There is a natural attempt to suggest in various summaries and press releases that progress is rendering the global warming scenario more certain. However, scrutiny of the detailed statements reveals no real evidence of this. Rather, one finds such odd contradictions as the 1990 and 1992 reports claiming broad consistency between model predictions and observations, while the 1994 and 1995 reports attempt to use the very uncertain and largely undocumented behavior of sulfate aerosols to account for the previously ignored discrepancies between predictions

with which these reports are produced has little to do with the normal cycle of scientific research. Also, the effort involved in producing such a flurry of documents is largely incompatible with doing research. I would suggest that one is seeing a fairly harried effort to preserve whatever consensus has been forged until policy can be enacted.

Packing the consensus

Of course, the whole issue has been further confused by the attempt (largely successful) by environmental advocates to mix natural with forged consensus, natural climate fluctuations with anthropogenic warming, insignificant warming with large warming, and the present relative warmth with predictions of steadily increasing warmth. To this they have added totally hypothetical claims of various consequences of putative global warming, and in all of this, they have been abetted by journalists. The whole disorderly exercise has been subsumed within a single label, and universal scientific agreement has been claimed for the resulting confusion⁵. It feels most peculiar to be labeled a contrarian for recognizing the very weak foundations (if any) of this composite claim. To make matters worse, the exaggerated composite claims have formed the basis for an international political process which aims to control energy usage by controlling carbon emissions. The enthusiasm for the political actions stems from a large variety of motivations. A few of the most obvious ones are the very large degree of bureaucratic influence offered by energy control, competitive advantage among different energy producers based on differing carbon emissions, the recycling of old efforts at energy policy that have been frustrated by the decreasing prices of fossil fuels since the energy shock of 1973, etc. To the extent that curbs on fossil fuel consumption inhibit development in the developing countries, we have the traditional attempt of the 'haves' to avoid sharing with the 'have nots.' There are also issues of vanity. It has been claimed that Crispin Tickell (a British diplomat who published a small book on the need for an international response to global cooling) convinced Margaret Thatcher to take up the cause of global warming because with her background in chemistry she could assume leadership among her fellow world leaders. Similarly, there is little doubt that Vice President Gore's enthusiasm for environmental causes is part of his self-image as a new age futurist.

Scientific acquiescence

At this point, the situation has moved vastly beyond what could be justified in any way by science. Rather, there has been emphasis on the fact that science cannot rule out global warming, cynically ignoring the fact that science is generally incapable of ruling out anything. Nonetheless, there has been surprisingly little objection from the scientific community, and such objection as has been made is typically confined to private exchanges and papers addressed purely at ones colleagues.

and observations.

⁵ Advocacy groups by their nature are far better equipped than individual scientists to communicate with the public. This undoubtedly contributes to their ability to coopt the scientists.

A recent example was the publication by world leading experts in hurricanes that there was no reason to suppose that, even were global warming to occur, it would have any particular affect on hurricanes⁶. However, the statement was published in the *Bulletin of the American Meteorological Society*, and received no wider publicity. To be sure, this is the normal approach toward communication taken by scientists. Going ‘public’ is unusual. Although the absence of open scientific objection to the misuse of science seems surprising to the public, it is actually the norm. This has been taken by the public to constitute scientific support for the popular depiction of the science, and, indeed, there have been frequent efforts by advocacy groups to reenforce this view. They are abetted by scientists outside the core area of climate change, itself, who wish to exploit the issue for their own benefit. Thus the health sciences have been making a major pitch to examine the implications of the putative warming for epidemics⁷. A naive public response to this situation has held that scientists, being governed by a selfless concern for the truth, would not go along with this if it were not justified. Of course, there is enough cynicism abroad that would recognize that scientists might not be as pure as all that, but it is interesting to examine what, exactly, is the mode by which scientists appear to accommodate this exploitation. The particular problems of this and other environmental issues stem, as far as I can tell, from the interaction of science, nominally science based advocacy⁸, and politics. The credibility of the first is something the remaining two cannot resist exploiting, while the power and publicity wielded by the second pair are frequently irresistible to the first. The situation is complicated by the fact that there is no clear definition of who is a relevant scientist. Advocacy groups characteristically use information to gain special influence over the political process. Their trophies, so to speak, are legislation, regulation, and treaties, and it would appear that their existence is an automatic feature of the political system. It is not at all clear that advocates have any specific political agenda. In many instances they may simply be eager to translate science in the interest of some perceived public good. However, such perceptions are commonly political, and the fact that advocacy groups measure their success in terms of political effectiveness inevitably entrains them into the political process. Finally, both advocates and politicians tend to view science in terms of facts rather than process – leading to eventual conflict with scientists and science.

⁶ Lighthill, J., G. Holland, W. Gray, C. Landsea, G. Craig, J. Evans, Y. Kurihara, and C. Guard, 1994. Global climate change and tropical cyclones. *Bull. Am. Met. Soc.*, **75**, 2147-2157.

⁷ Stone, R., 1995: If the mercury soars, so may health hazards. *Science*, **267**, 957-958.

⁸ It is important to distinguish science or issue based advocacy groups from industry advocacy groups. The latter are clearly recognized as serving the special interests of business. The former are commonly thought to represent ‘public’ interests, though one might sometimes argue that the business they represent is themselves.

Human heredity, eugenics, and immigration law

Somewhat by accident, I came to realize that we've been through all this before. The interaction of genetics, eugenics, and the politics of immigration in the early 1920's has been studied at great length, primarily as an example of the misuse of science in the interests of racism. It was in this connection, that I was given an article by Jon Beckwith to read⁹. However, whatever the implications of this case for the responsible application of biology, it is also a remarkable example of the interaction of science, advocacy, and politics. Although it will be obvious that I am neither an historian nor a social scientist, I find the history of this matter helpful in understanding contemporary environmental issues, and I would hope that those more capable than I am would examine it in a more professional manner. The following are my impressions of this issue. What I am discussing here is largely based on two books¹⁰ and a number of articles¹¹. I lay claim to no intensive searching of archives.

The primary actors in this story are a biology community that had embarked on the study of human genetics, an advocacy movement, eugenics, that was intent on applying human genetics immediately to the betterment of the human race, and a political configuration concerned with America's alarm over immigration. I will focus on the American branch of this story, though the uglier example of a similar interaction in Germany is certainly better known. Briefly, segments of the biology community studying human heredity began, in the early part of this century, to consider the possibility that 'feeble-mindedness' might be a simple Mendelian genetic characteristic characterized by a single recessive gene. The eugenics movement seized on this as the basis for a variety of practical actions including forced sterilization. During World War I, primitive intelligence tests were administered to army inductees that suggested rampant feeble-mindedness in the population as a whole (47% of all Caucasians), and claims were made that immigrants from southern and eastern Europe were particularly affected. A general anti-immigration mood found support in the more noble notion of preserving America's genetic quality from foreign pollution with enthusiastic encouragement from the eugenics movement. Congress seized on the issue of genetics as an objective rationalization for immigration restriction, and passed the Immigration Restriction Act of 1924. Even then, it was coming to be widely understood in the genetics community that feeble-mindedness was not a simple genetic characteristic. Recognition was also developing that both the intelligence test used among the inductees and the administration of the test (in English) were deeply flawed. There was even some public opposition from the scientific community to the

⁹ Beckwith, J., 1993. A historical view of social responsibility in genetics. *BioScience*, **43**, 327-333.

¹⁰ Kevles, D.J., 1985. *In the name of eugenics*. Knopf, New York, 426pp. Ludmerer, K.M., 1972. *Genetics and American society*. Johns Hopkins, Baltimore, 221pp.

¹¹ Allen, G., 1975. Genetics, eugenics, and class struggle. *Genetics*, **79**, 29-45. Provine, W.B., 1973. Geneticists and the biology of race crossing. *Science*, **182**, 790-796. Beckwith, J. *ibid*.

premature application of uncertain science. However, the scientific opposition was mild, and easily ignored or coopted. Today, the archives show that there was substantial private correspondence among prominent geneticists decrying the abuse of their science in connection with the passage of the immigration act. However, generally the most prominent geneticists were publicly silent on the issue, and many even continued to support the eugenics movement. Professional societies, as such, never objected to the abuse of genetic science even after the particularly blatant abuse by the Nazis.

In addition there were individuals with scientific credentials who endorsed the eugenic claims, and one of these was designated by Congress as the ‘leading expert’ on the application of genetics to immigration law. This individual, Harry Laughlin, eventually received an honorary doctorate in 1936 from Heidelberg University.

In attempting to account for the passive, and even cooperative, behavior of the scientific community, one uncovers what I suspect is a fairly generic example of the interaction of science, nominally science based advocacy, and politics. Certainly, relative to this earlier example, present examples offer little if anything anomalous. For present purposes, there are obvious analogies between fears of environmental degradation and fears of genetic degradation, the environmental movement and the eugenics movement, and environmental legislation and immigration legislation¹² (Some similarities between the global warming issue and the earlier case were, in fact, noted by Kevles¹³).

In what follows, I can only sketch what appear to me to be characteristic features of this interaction.

The assumption of high moral purpose by an advocacy movement

In the late 19th Century in England, the study of human heredity and eugenics were synonymous. Ignorant of Mendelian genetics, the British biometricians developed sophisticated mathematical tools in order to determine the role of heredity. Indeed, early British scientific eugenicists like Pearson and Fisher were also prominent among the founders of modern statistics. Almost immediately, the idea gained some popularity that the scientific findings should be immediately applied to the betterment of the human race, and advocacy groups developed with this aim. The following quotes typify the situation:

¹² There is, of course, one potentially major difference. Science today is heavily dependent on government support. This was not the case in the early part of this century. Thus, in the earlier case, there is relatively little reason to believe that concern for government funding was a major factor. Today, this factor would be harder to rule out. However, it might be possible to consider government funding as just another form of public recognition – a factor present in both cases.

¹³ Kevles, D.J.: Paradise lost, *New York Review of Books*, Dec. 21, 1989, 32-38.

“The best minds of today have accepted the fact that if superior people are desired, they must be bred; and if imbeciles, criminals, paupers, and [the] otherwise unfit are undesirable citizens they must not be bred.”¹⁴

Victoria Woodhull, *The Rapid Multiplication of the Unfit*, 1891

“Is it Utopian to hope ... that the ethical conscience of the average man will come more and more to include in its varied content ‘a feeling of responsibility for the healthfulness of succeeding generations’?”¹⁵

J. Arthur Thomson (British biologist) in *Heredity*, 1912

“Certain definite principles of genetic transmission have been disclosed. And since it is becoming more and more apparent that these hold for man as well as for plants and animals in general, we can no longer ignore the social responsibilities which the new facts thrust upon us.”

Michael Guyer, *Being Well-Born*, Bobbs-Merrill, 1916

As Ludmerer¹⁶ notes, “Eugenicists’ strong feeling of moral purpose understandably contributed to their marked self-assuredness and sense of self-righteousness in discussing the eugenics program. When they (the eugenicists) campaigned for legislation, officials and other citizens could not help but heed the fervent, impassioned pleas of so many eminent persons.”

Scientists, themselves, were not impervious to the moral fashion established by the advocates. Nor did they object to the public recognition given them and their field by the advocates.

¹⁴ Alexander Graham Bell, Theodore Roosevelt, the Bishop of Ripon, George Bernard Shaw, Margaret Sanger and Havelock Ellis were all enthusiastic eugenicists; the claim concerning the ‘best minds’ was not totally unjustified. To be sure, the specific views of these individuals differed.

¹⁵ It is interesting to see the invocation of the currently popular inter-generational equity issue in the context of eugenics.

¹⁶ *ibid*

We shall return to this important influence later¹⁷. However, it is worth noting that the publicly perceived exercise of ‘scientific responsibility’ amounted to accepting the position of the eugenicists.

The power of self-righteousness can be illustrated by the case of Esther Meyer, a non-English speaking immigrant girl, who was in 1916 recommended for confinement in a custodial institution because of seeming low intelligence. Justice Goff, in rejecting the recommendation, admirably warned that ‘the votaries of science or pseudo-science’ could too easily make prejudiced testimony of the tests. One might have hoped that Justice Goff would have been praised for his insight. *The New York Times*, however, decried Goff’s decision, claiming that “The Binet-Simon tests, intelligently applied, are as trustworthy as the multiplication table.”¹⁸

Eugenics worked its way rapidly into college curricula, and remained there long after much of its basis had been discredited. This is but one of the processes acting to rigidify public perceptions of science despite contradicting scientific developments. This rigidity is at least partially associated with the previously mentioned tendency of advocacy groups to emphasize nominal facts over process. As noted by Kevles, “the large majority of American colleges and universities – including Harvard, Columbia, Cornell, Brown, Wisconsin, Northwestern, and Berkeley – offered well attended courses in eugenics, or genetics courses that incorporated eugenic material.” As late as 1931, Harry Emerson Fosdick, the widely known pastor of the Riverside Church in New York, could argue that “few matters are more pressingly important than the application to our social problems of such well-established information in the realm of eugenics as we actually possess.” In fact, eugenics remained in the curriculum even longer. Those of us who attended high school in the fifties are likely to recall being taught as fact one of the central myths of eugenics: namely the stories of the hereditarily degenerate Jukes and Kalikak families¹⁹.

¹⁷ Advocates generally extract a payment for this recognition by assuming the right to represent the science in the manner they wish. Ludmerer presents an interesting early example. In 1910, the Eugenics Laboratory, under Karl Pearson, published a report on the children of alcoholic parents in which the investigators were unable to state that the children of alcoholics were less healthy than those of non-alcoholics by the time of school age. This prompted a reply published in the *London Times* by Montague Crackenthorpe, the chairman of the Eugenics Society, who termed the conclusion “contrary to general experience” without presenting a single piece of evidence in support of his view. The Society continued its attack on the report of the Laboratory despite the conciliatory efforts of Sir Francis Galton (founding director of the Eugenics Laboratory and honorary chairman of the Eugenics Society). So great was the antagonism between the two (Galton and Crackenthorpe), however, that he (Galton) *almost* resigned from the Society. (emphasis added)

¹⁸ Kevles, *ibid*

¹⁹ The Jukes family was a family claimed to have been characterized by excessive incidence of feeble-mindedness. The Kalikaks were supposed to have been two families descended from a

Apart from a sense of high moral purpose, popular acceptance of an issue seems to require a simplistic picture of the underlying science together with ‘events’ that supply an immediacy to the resulting ‘understanding.’

Simple minded pictures and events

The popularity of the issue did not really take off until the rediscovery of Mendelian genetics in 1900. The simple mechanistic picture of single gene inheritance had the immense appeal of making heredity ‘understandable’ even though the picture proved to be frequently wrong and inadequate – especially for feeble-mindedness. There is an important intellectual point here. It would appear that for a nominally science based issue to catch on, there must be an almost trivial picture of the underlying scientific principle that can be widely ‘understood.’ Mendelian genetics satisfied this need; the sophisticated statistical analyses of the biometricians did not. A similar role exists in the global warming issue for the simplistic picture of the greenhouse effect wherein the increase in gases which absorb heat radiation (i.e., infrared radiation) must inevitably lead to warming. It is apparently irrelevant that the simple process described is not only very seriously incomplete (the actual greenhouse effect is only about 25% of what the illustrated mechanism would produce), but leads, by itself, to very little warming from projected increases in CO₂.

Translating such ‘understanding’ into legislation and policy ultimately requires popular support transcending the advocacy groups alone. It appears that ‘events’ are the method of choice for achieving this. By ‘events’ I mean some finding, relevant or not, true or not, which can dramatize the issue and generate, if possible, a degree of public hysteria. The hot summer of 1988 served this function in the global warming case. The finding of rampantly increasing feeble-mindedness served a similar function for eugenics movement. The claim that southern and eastern Europeans were particularly affected was used to imply that immigrants were instrumental in the ‘epidemic’ and that their continued admission into this country was a threat to our future.

For the most part, ‘events’ don’t just happen. Enthusiasm within the environmental movement for control of carbon emissions arose during the early 80’s, but it was quickly recognized that one would have to await an ‘event’ in order to mobilize the public. In 1912, Irving Fisher, a professor of economics at Yale, and prominent in the eugenics movement, wrote to Charles Davenport, a prominent geneticist, “The stresses of immigration alone provided a golden opportunity to get people in general to talk eugenics.” When immigration came to the fore of the political agenda, the eugenics movement was ready to provide the ‘scientific’ foundation.

The final element in this brew appears to be the establishment of scientific credibility for the advocacy movement and the suppression of opposition. In the global warming issue, the IPCC and

common male ancestor in the 18th Century. One family originated in the union of the patriarch with a bar wench and was persistently degenerate, while the other family resulted from a subsequent union with a respectable woman and gave rise to distinguished citizens.

its forged consensus has been the dominant mechanism. The situation with eugenics was somewhat more primitive.

Achievement of scientific credibility

One of America's most important enthusiasts for Mendelian genetics was Charles Davenport, a respected scientist (he was elected to the National Academy) and an even more effective scientific entrepreneur. He managed to convince the Carnegie Institution of Washington to set up the Cold Spring Harbor Laboratory for the experimental study of evolution in 1904. His approach to studying human heredity was to gather numerous pedigrees which were to be studied in order to determine heritable characteristics. In order to carry out this effort on an appropriate scale, Mary Harriman, a noted progressive²⁰ and the sister of Averell Harriman, funded (through the Carnegie Institution) the creation of the Eugenics Records Office at Cold Spring Harbor. The Office was headed by Harry Laughlin, who had a doctorate in biology from Princeton, but who was apparently not regarded as a significant scientist within the scientific community. The Office employed hundreds of field workers, most of them volunteers. Davenport was generally considered to be overenthusiastic and incautious in his science. He was convinced that numerous human characteristics including 'feble-mindedness' were simple single gene characteristics. His instructions to field workers displayed a painful lack of scientific objectivity. The following quote illustrates this:

“The field worker finds a person suffering from feeble-mindedness, a descendent of two normal parents – by hypothesis both of these parents are simplex (Davenport's term for heterozygous); the field worker must understand that each parent will probably have somewhere in his or her ancestry a feeble-minded person and it is the business of the field worker to make a special search for such a person or persons in the pedigree.”

Charles B. Davenport, *The Study of Human Heredity*, Cold Springs Harbor, 1911.

²⁰ The reference to Mary Harriman being a progressive is neither irrelevant nor capricious. As Ludmerer, remarking on the close relation of the eugenics and progressive movements, notes, “Madison Grant, John C. Merriam, and Henry F. Osborn, all well-known eugenicists, were leading conservationists and friends of Theodore Roosevelt. Edward A. Ross, a staunch supporter of compulsory sterilization and birth control, and the author of the widely read plea for immigration restriction, *The Old World in the New* (1914), was part of Robert La Follette's University of Wisconsin brain trust; his vigorous defenses of academic freedom, and his leadership in the American Association of University Professors had also made him an eminent progressive.” This might seem to contradict a common perception (Allen *ibid*) that the eugenics movement was essentially conservative and racist as opposed to the environmental movement which has come to be associated more with the left. I would suggest that both are movements of the educated elite, although the social and political character of this elite may have changed with time.

The focus on supporting rather than testing hypotheses is a noted characteristic of environmental studies as well, and characterizes the IPCC process; it is also antithetical to normative scientific methodology. Not surprisingly, the effort produced ample material for the political aspirations of the eugenics movement. The eugenicists were hardly oblivious to the implications of the efforts of Cold Spring Harbor. Davenport, himself, did not involve himself in the application of eugenics to the politics of immigration. Rather, as already noted, Congress' leading expert on this matter was his assistant, Harry Laughlin of the Eugenics Records Office. Laughlin stated his position on the matter with admirable simplicity: "Making all logical allowances for environmental conditions, which may be unfavorable to the immigrant, the recent immigrants, as a whole, present a higher percentage of inborn socially inadequate qualities than do the older stocks."²¹ Quite obviously, Congress was committed to establishing the credibility of Laughlin. It is interesting to see how this was achieved by a combination of bald assertions by Laughlin in his own behalf combined with the reaffirmations of Rep. Alfred Johnson (chairman of the House Committee on Immigration and Naturalization) and others. Here are some examples of Laughlin's statements:

"I made this biological investigation and put the facts on record here for the benefit of the committee, which must draw its own conclusions. I am not here as an advocate for or against any race. Indeed, my position with the Carnegie Institution of Washington would prevent me from standing as an advocate or special pleader. I am here simply as a scientific investigator to present the facts to the gentlemen of the committee, with the hope that the facts and their analysis might be of use."²²

There were objections to what Laughlin was doing. Again quoting Ludmerer, 'Rather than answering objections to his work, he (Laughlin) ridiculed his critics and bragged of his "scientific authority."' "The only criticism which I must take most seriously is that of Prof. H.S. Jennings of Johns Hopkins," he said; and by a remarkable twist of logic he found Jennings in agreement with him. Jennings in fact had appeared before the House Committee to impugn Laughlin's conclusions! The other critics, as far as he was concerned, were merely bitter losers²³. "If the facts had turned the

²¹ Harry H. Laughlin (1922) "Analysis of America's Modern Melting Pot," *Hearings before the House Committee on Immigration and Naturalization*.

²² Harry H. Laughlin (1924) "Europe as an Emigrant-Exporting Continent," *Hearings before the House Committee on Immigration and Naturalization*. As Kevles notes, Laughlin actually frequently 'twisted the facts (often he had found proportionately more native- than foreign-born in asylums) and indulged in blatant prejudice (recent immigrants, he said, might themselves be healthy, but they carried bad recessive genes, which would sooner or later out).'

²³ I have a certain personal interest in this story. When I finally went public with my objections to the global warming issue, I was initially accused of not having 'expertise.' When the implausibility of this claim became evident, there was a curious attempt by then Senator Gore and others to get me to recant my objections. Some of the details of this affair are given in Lindzen, R.S.

conclusions in another direction,” he declared, “I doubt not that the present critics would have been silent.” “When the criticism is made by a person who has never conducted studies of this sort and who tries to predict what he would find if researches were made in a certain way, and who calls the present studies biased, and who is trying, apparently, to count out the value of the study because its conclusions are displeasing to him, the scientific investigator must, despite his joy in a good fight, ignore petty heckling.”

Rep. Johnson reassured Laughlin²⁴:

“Don’t worry about criticism, Doctor Laughlin, you have developed a valuable research and demonstrated a most startling state of affairs. We shall pursue these biological studies further.”

The admiration was hardly one-sided. As Ludmerer notes, ‘In 1923, Rep. Albert Johnson, in honor of his many “services” to the cause of eugenics, was elected honorary president of the Eugenics Research Association²⁵. Laughlin called him “the great American watchdog whose job it is to protect the blood of the American people from contamination and degeneracy.”’

The case of Jennings is not without interest. He was, indeed, regarded as one of the leading geneticists, and it was clearly advantageous for someone like Laughlin to pretend to some parity with Jennings. Jennings’ objections were clear but typically turgid and unpointed:

“Knowledge has moved rapidly and has, indeed, changed fundamentally within the last ten years, altering the picture as to the relations of heredity and environment. What has gotten into popular consciousness as Mendelism – still presented in the conventional biological gospels – has become grotesquely inadequate and misleading.”

H.S. Jennings, *Prometheus*, 1925.

The ineffectiveness of Jennings’ objections may be inferred from a letter to Jennings by Raymond Pearl (who was both a prominent geneticist at Columbia, and a one-time enthusiast for eugenics):

“Without having gone at all deeply into the matter, I have had a strong feeling that the reactionary group led by Madison Grant and with Laughlin as its chief spade worker were likely, in their zeal for the Nordic, to do a great deal of real harm. So far as I can learn, there is no other group which

(1992) Global warming: the origin and nature of the alleged scientific consensus. *Regulation*, Spring 1992 issue, 87-98.

²⁴ Ludmerer *ibid* p.109.

²⁵ The tendency of advocacy groups to adopt euphemistically misleading names is already apparent.

makes the least pretension to being scientific which is interesting itself in any practical way in this pending immigration legislation. From what I hear, I judge that the opinions of Congressmen generally regarding this group is that it is the only one which has any scientific knowledge about immigration.”

Raymond Pearl in letter to Herbert S. Jennings, November 24, 1923

Jennings’ ineffectiveness may not have been totally unintentional, at least at the unconscious level. He, and other scientists, were clearly pleased by the public attention that eugenics and politics brought to them. Jennings, in his 1930 book, *The Biological Basis of Human Nature* states: “Gone are the days when the biologist ... used to be pictured in the public prints as an absurd creature, his pockets bulging with snakes and newts. ... The world ... is to be operated on scientific principles. The conduct of life and society are to be based, as they should be, on sound biological maxims! ... Biology has become popular!”²⁶

The issue of scientific credibility is a more extensive problem than the above sketch may suggest. Outside any given specialty, there are few (including scientists) who can distinguish one scientist from another, and this leaves a great deal of latitude for advocates and politicians to invent their own ‘experts.’ Moreover, public recognition as such an ‘expert’ seems to mute public criticism by colleagues. There are useful sanity checks for the general public. The *Citation Index* comes to mind, though it is hardly perfect. Even when scientific problems are acknowledged, there is the common demand that policy not wait on the resolution of these problems since the issue is of such urgency. This was as true in the case of immigration law as it is during the present concern with ‘global warming.’ In effect, once political action is anticipated, the supporting scientific position is given a certain status whereby objections are reckoned to represent mere uncertainty, while scientific expertise is strongly discounted.

Consequences

In any event, the Immigration Restriction Act of 1924 was passed, and remained the law of the land until the 1960’s. America’s doors were largely closed to the victims of Hitler’s racism. It would, of course, be naive to suppose that the Act was passed solely or even primarily because of the ‘scientific’ rationale. However, such a rationale gave an overall respectability and aura of objective necessity to the political decision. Indeed, the activities of America’s eugenics movement lent a certain approbation even to the Nazi eugenics movement. This was sufficient to provoke far more widespread denunciation of the abuses of genetic science within the scientific community, though one might question whether there would have been comparable objections if racism had not been involved. It should be added that the whole field of human genetics fell into disrepute during

²⁶ A far harsher view of the geneticists of the 1920’s has recently been presented by D.B. Paul and H.G. Spencer in *Nature* (The hidden science of eugenics, *Nature*, **374**, 302-304, 23 March 1995)

the 1930's, and the Carnegie Institution closed the Eugenics Research Office in 1940, forcing Laughlin's early retirement. Spurred by the concern over the effect of radiation on genes, the field was essentially reborn in a far healthier form in the late 1940's.

As we have seen in this brief sketch, the interaction of science, advocacy and politics in both the global warming and eugenics cases share a number of characteristics:

Powerful advocacy groups claiming to represent both science and the public in the name of morality and superior wisdom.

Simplistic depictions of the underlying science so as to facilitate widespread 'understanding.'

'Events', real or contrived, interpreted in such a manner as to promote a sense of urgency in the public at large.

Scientists flattered by public attention and deferent to 'political will' and popular assessment of virtue.

Significant numbers of scientists eager to produce the science demanded by the 'public.'

Given the automatic tendency of our educated elites to form advocacy groups, the above interactions would appear to have a certain inevitability, and the advantages of advocacy groups over individual scientists in communicating with the public will inevitably give advocacy groups an opportunity to dominate the presentation of the science. This represents a fairly discouraging prognosis for the interaction of science and politics. Nevertheless, even in the case of human genetics and eugenics, the situation eventually self-corrected, though it involved a hiatus in human genetics for about a decade. Politicization generally involves its own mechanism for self-correction. Politicization causes decisions to come increasingly to depend on partisanship rather than science, and with the inevitable alternation of parties, there comes eventual deemphasis of the underlying issue. We can see this at the moment with respect to global warming. Whether a better approach to the problem of the interaction of science and politics can be devised is not obvious, but it is certainly a question worth examining.

Before ending, we should perhaps mention two aspects of scientists' attitudes towards nominally science-based issues. Scientists characteristically suppose that when science is claimed as the basis for political action, that the action will be subject to frequent review as the science evolves. It is, therefore, worth repeating that the political 'product,' the Immigration Restriction Act of 1924, remained unchanged for 40 years – well beyond the demise of the underlying 'science.' The point is that political actions are rarely simply a 'product' of science, and that once science has served its supportive function, its political role is essentially over.

Also, although ideally science is independent of moral fashions, in practice there is undoubtedly an influence. Under the circumstances, it is reasonable to consider whether moral fashions are robust. In the case of eugenics, it is evident that the progressive moral fashion of one era later came to be regarded as morally repugnant. Whether the same fate awaits today's environmental ethos is impossible to predict, if only because of the ambiguities of the environmental ethos. However, to the extent that the current environmental ethos calls for restricting the economic prospects of the world's poorer countries, it is by no means inconceivable that it too will come to be regarded as repugnant by future generations.