

BOOK NOTE

CULTURE CLASH: LAW AND SCIENCE IN AMERICA

By Steven Goldberg.¹

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The impact of scientific progress on legal doctrine is pervasive yet subtle. Research projects such as the Human Genome Initiative, nuclear fusion, and artificial intelligence all have the potential to shape legal standards by changing the way humanity views itself; however, *Culture Clash: Law and Science in America*, by Steven Goldberg, warns against allowing the current trend of a preeminent "scientific voice" in matters of morality to continue. Goldberg claims that a lack of public expression of religious perspectives "allows science to carry weight far from its appropriate jurisdiction. Let this be an early warning—important values are at stake" (pp. 176-77).

Artificial intelligence provides the clearest example of this trend. While the potential of artificial intelligence has yet to be realized in a significant way, Goldberg claims that its impact on societal values is enormous (p. 155). In the attempt to make computers think like humans, philosophical issues of human consciousness and self-awareness seem to be at stake. As increasingly sophisticated "thinking" computers are built, defining what is uniquely human becomes more and more difficult. For example, though the Turing test is generally used to demonstrate consciousness, the philosopher John Searle argues that passing such a test still does not demonstrate consciousness (pp. 159-63). Goldberg believes that all such discussions revolve around scientific efforts to explain the mind. He finds a need for non-scientific ideas about the essence of humanity as well (p. 166). In this field, the intersection of science and law occurs when defining death or the point when medical treatment should end. Due to life-support technology, loss of whole brain function now signifies death (p. 168). More specifically, a difference is made between higher brain and lower brain function. This distinction is based

1. Professor of Law, Georgetown University Law Center.

upon the premise that consciousness and cognition are neocortical (higher brain, cerebral) functions (p. 168). The law is moving toward the medical consensus that patients in which cessation of higher brain function, including those in a chronic vegetative state, lack the brain functions which make humans unique, and thus can be allowed to die (p. 170). In contrast, Goldberg warns that "[t]he definition of death and the sanctity of human life should not turn on whether a digital computer or any other device appears to be conscious" (p. 177). Yet, he predicts that if computers reach the level of self-awareness, then humans will react by determining that humanity requires yet another trait which computers lack (p. 172). It is for this reason that his fears will never be realized. No matter what effect science has upon societal values, the human spirit will always prevail, precisely because it is indefinable by scientific terms.

In *Culture Clash*, Goldberg suggests that scientific views predominate in shaping moral values because the Constitution implicitly protects basic science research and prevents the establishment of any religion. First, Goldberg describes how the historical background of the Enlightenment influenced the framers of the Constitution to create a framework which indirectly shapes the supportive relationship between government and science (pp. 26-27). He demonstrates that judicial interpretations of the First Amendment freedom of speech clause include scientific publications, as envisioned by the framers of the Constitution (p. 29); for example, although obscene publications are outside the realm of the First Amendment, the Supreme Court has held that works of a sexual nature with serious scientific value are protected (pp. 29-30).² There are direct constitutional links between the government and science in federal authority over spending for the military, creation of a bureau controlling coinage weights and measures which now supports basic science research, and promotion of science through granting of patents and copyrights. More importantly, the Constitution implicitly provides for federal funding of science in its power to spend for the military and for the general welfare (p. 35). Goldberg persuasively argues that science enjoys a dual status, support from federal funding, and little restraint on intellectual freedom; this is in contrast to the arts or politics, where federal funding engenders fear of discrimination (pp. 39-41).

2. The book discusses the two cases: *Roth v. United States*, 354 U.S. 476, 487 (1957), and *Miller v. California*, 413 U.S. 15, 22-23 (1973).

Goldberg then discusses how science is favored over religion because modern courts have interpreted the First Amendment Establishment Clause to require a complete separation of church and state (pp. 70-72, 83). He calls it "an unintended consequence of the framers' attitudes toward religion, science, and the state. Preventing the establishment of religion has never meant, either historically or in court, that religious perspectives cannot be expressed in public debates over morality" (p. 179). He contends that the problem is a lack of religion in school, as evidenced by the battles over the teaching of evolution and creationism in public schools and the protected status of basic science research. Goldberg contrasts this to other laws with religious roots, such as those which criminalize homosexual behavior. He suggests that science is not threatened in these cases, and thus Establishment Clause challenges have failed (p. 77-78). "The establishment clause cannot be understood solely as a statement about religion; its content depends upon the context in which religion is operating. When religion shapes our moral standards, constitutional scrutiny is more lax than when religion shapes our scientific standards" (p. 78). If homosexuality is found to have a genetic basis,³ then by Goldberg's argument, the anti-sodomy laws should be overturned.

Because the Establishment Clause has worked so well, Goldberg feels that the void created by the absence of a "loud voice for traditional religion" has been filled by science (p. 82). He warns against science playing a major role in value-formation, because "matters of morality . . . are not subject to the scientific method" (p. 83). "Science does not tell us what we ought to do. . . . A discussion of whether a computer can be built or whether a genetic therapy can be achieved quietly slips into an assumption that the computer or the therapy ought to be undertaken" (p. 82). This is the weakest argument presented in *Culture Clash* for two reasons. First, Goldberg has understated the strength of national morality, as evidenced by the anti-abortion fight, and the laws heavily regulating the use of fetal tissue in medical research.⁴ Second, his argument that scientific progress will blind the public to moral concerns ignores the fact that scientists are moral human beings too, and thus will weigh all issues including social ones, eventually. A

3. See Dean H. Hammer et al., *A Linkage Between DNA Markers on the X Chromosome and Male Sexual Orientation*, 261 SCI. 321 (1993); see generally Thomas H. Maugh II, *Study Strongly Links Genetics, Homosexuality*, L.A. TIMES, July 16, 1993, at A1.

4. See generally Gregory Gelfand & Toby R. Levin, *Fetal Tissue Research: Legal Regulation of Human Fetal Tissue Transplantation*, 50 WASH. & LEE L. REV. 647 (1993).

discussion of whether a therapy can be achieved does not automatically slide into an assumption that it should be done—this point should be evident to Goldberg since he later recounts how biologists concerned about the potential dangers of recombinant DNA work, on their own initiative, drafted voluntary research safety guidelines (p. 124).

Goldberg recognizes that “[m]any scientists do care greatly about the ultimate practical impact of their work, but that concern is often secondary to the fundamental search for knowledge” (p. 11). On the other hand, when commercially viable products (Goldberg’s definition of technology versus basic research) are developed and marketed, the Constitution has empowered Congress to regulate such technology through the Commerce Clause by regulating interstate commerce through the power to spend for the general welfare by making the receipt of federal funding contingent upon legal conditions (pp. 85-86). Again, most of these powers have been delegated to various federal agencies, but judicial review of regulatory decisions is much more stringent (pp. 90-91). This legal control of technology is completely different from the relative freedom from control at the basic research level. Goldberg defines this differential of little public involvement at the research end to high public involvement at the application end as the regulatory gap (p. 94). This is the intersection of cultures, where “the stage is set for a gap when ideas become products and when peer review and consensus give way to adversary procedures and interest group politics” (p. 94). This problem is only exacerbated by the public failures of technology to live up to their promises—nuclear energy is cited as a chief example, where “[m]ore attention in the early years to social concerns that would accompany commercialization would have reduced later regulatory problems” (p. 98).

Narrowing the regulatory gap is in the interests of the scientific community, because “[p]ure scientists may love science for its own sake, but the public funds it because of potential payoffs” (p. 103). Goldberg suggests that this will occur as scientists become “science counselors” (p. 103). Science counselors are researchers who take social factors into account during the basic research process. The idea being that if the research is channeled into socially acceptable pathways initially, then choices made along the way can increase the chances that a product will be commercially successful and socially acceptable in the end. He distinguishes these science counselors from other prominent scientists who often have stopped doing research and are only involved in political concerns, or from scientists who are involved in advising governmental

agencies. Science counselors measure their work by social progress; their research is carried out within social constraints. The problem with this approach is the uncertainty between basic research and practical application—often there is no direct or obvious link between a discovery and a final product. In addition, research in one field may appear to have no practical application until new discoveries make it important in another discipline. If all research were carried out with a social goal in mind, scientific progress would be slowed considerably. Goldberg recognizes this; he agrees that some balance must be found between the “knowledge for its own sake” goal of pure scientist and the social concerns represented by the science counselors (p. 183).

Goldberg suggests that this gap between promise and performance in American science is an inevitable result of the intersection of law and science because the current legal system supports a scientific perspective at the level of basic research. Then he switches to considering social concerns at the level of practical applications, requiring governmental regulation. In addition to artificial intelligence, he presents the Human Genome Initiative and nuclear fusion as two other fields whose advances are already shaping society’s values, even though their practical benefits are still very much in the distant future (p. 111).

In the Human Genome Initiative discussion, Goldberg praises the efforts of geneticists who observed a moratorium on certain types of DNA research, then drafted safety guidelines which formed the basis for current governmental regulations (p. 124). He cites this as an example of science counselors working toward public acceptance of genetic engineering and greater public use of technology (p. 124). Twenty years later, the public’s fear of genetically engineered tomatoes and the use of artificially produced bovine somatotropin hormone to stimulate milk production in cows suggests that the efforts of these scientists have fallen short.⁵ This initiative also raises legal issues surrounding the techniques of gene therapy and genetic screening for diseases. Because of the regulatory gap, no societal consensus has been reached on issues like what gene therapy should be used for, whether genetic testing should be required, and if so, if the information obtained should be available to

5. See Boyce Rensberger, *Biotech Tomato Headed To Market Despite Threat*, WASH. POST, Jan. 12, 1993, at A3; *Altered Tomato Wins FDA Approval. The Controversial Food Soon Will Be In Grocery Stores In the West and Midwest*, DES MOINES REG., May 19, 1994, at 1; Daniel Roth, *Anxiety Over Hormone Put in Milk has Grazers Worried*, CINCINNATI ENQUIRER, Feb. 5, 1994, at B1; Gregory N. Racz, *FDA Panel Finds Hormone Safe for Milk*, WALL ST. J., Apr. 1, 1993, at B6.

employers or insurance companies. This is where the legal system must step in and balance privacy and efficiency concerns of such information (p. 127).

Although the practical impact of the Human Genome Initiative will not reshape society until these issues have been resolved, Goldberg shows that it has already had a negative impact on the formation of societal values. In the media, genetic technology is presented as the key to giving humans the "Godlike" power to improve their condition (p. 128). The possibility of manipulating human traits is scientifically dubious and much more complex than the simple one gene per trait formula espoused by the press, which ignores all environmental influences (p. 128). Goldberg suggests that since Americans built this country on the theory that one's position in life can be bettered, this easily expands into the scientific belief in the "inevitability and desirability of progress," including genetic manipulation to the degree of eugenics (p. 129).

Goldberg finds fault with accepting the scientific model of what it is to be human (some combination of genetic heredity and environment), with its attendant assumption that all human behavior is explainable because it removes the possibility of free will, including the concepts of responsibility, praise, and blame (p. 129). He argues that secular and theological discussion of the issue of free will do not promote any established religion; therefore, no constitutional questions are raised, and thus, religious perspectives do not impinge upon the protected status of science (p. 129-30). Hence, the public should be encouraged to consider all viewpoints rather than simply accepting only the scientific perspective of humanity (p. 130). These concerns seem excessive. Although ignorance of how genetic information can be used or interpreted can be remedied, the unsophisticated viewpoint of the public virtually guarantees that the scientific perspective of progress for the sake of progress will never become paramount.

Nuclear fusion is also presented as a project with extraordinary promise. Because fusion energy requires radioactivity, public opposition is inevitable. Public fear of radioactivity could be addressed by education (p. 136), but Goldberg merely notes this in passing since he seems more interested in capturing the problem rather than exploring possible solutions. In this case, the problem is that the Department of Energy has committed itself to one type of approach—a magnetic confinement system for fusion containment. If the final product is socially unacceptable, it may spell the end of nuclear fusion (p. 138). In some respects, it makes sense to account for societal concerns during initial research. However,

this presupposes that the concerns do not make the project impossible at the start; after all, other breakthroughs during the development period could reduce or eliminate the problem before commercial production begins.

Nuclear fusion is a prime example of Goldberg's point that scientific advances, no matter how far in the future, improperly influence societal values and expectations. "[E]ven the distant prospect of limitless energy can affect our thinking about the appropriate scale for human technology" (p. 132). He questions the scientific belief that progress is endless, since this belief has resulted in the public assuming that fusion or some other technology, like solar energy, will be developed to solve any future energy needs, even though the desirability, costs, and state of knowledge currently make these sources impractical or infeasible. Goldberg calls this the "image of endless plenty" (p. 149). He argues that the cultural image of human potential must be balanced by a reminder of human frailties (pp. 149-50). He does not equate reminders of human limitations with the establishment of religion. Rather, they help develop a more well-rounded view of humanity where "the human condition is not something to be cured by technology" (p. 150).

Culture Clash emphasizes that science plays too great a role in shaping societal values because it is protected by the legal system in the initial basic research stage (p. 178). The intersection of law and science also results in a regulatory gap at the practical application level, partly caused by a lack of information. Goldberg recognizes that the gap could be narrowed by making the public more comfortable with new technology, since the current notion is that it has "gotten out of hand" (p. 94-95). Although one viable solution, public education, is brushed aside in favor of extolling the virtues of religious perspectives on moral matters, *Culture Clash* is worth reading simply for the issues Goldberg raises in discussing the Human Genome Initiative, nuclear fusion, and especially, artificial intelligence. By defining the relationship between law and science, this book is the first step towards conceiving a solution.

Terry L. Tang

