Risk in Culture: The American Conflict Over Nuclear Power

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It has become commonplace to assert that technological risk is a social phenomenon. Social science studies typically establish the point by showing that risk avoidance involves more than scientific criteria. No group responds to all risks in a way that is directly proportional to the magnitudes of the physical hazards involved, and different social groups avoid different kinds of hazards differently. The public controversy over nuclear power has provided the paradigm case, for the decade-long entrenchment of pro-nuclear and anti-nuclear alignments in the face of changing evidence about the hazards of nuclear power stimulated much of the research on risk in the first place.

In demonstrating that action to support or oppose nuclear power has social dimensions, however, social science studies have been guilty of the inverse problem, failing to include any role for scientifically based knowledge claims. A host of sociological studies, for example, has sought to explain the actions of pro-nuclear and anti-nuclear groups as the causal product of ideological beliefs or social structural variables without explicitly considering their claims about the hazards of the technology, even while asserting that technical issues remain at the "center" of the dispute (Del Sesto 1979; Nelkin 1981a, 1981b, 1981c; Mazur 1981; Barkan 1979; Useem and Zald 1980). The source of this omission is a theoretical assumption: by analytically separating social and scientific factors as mutually exclusive, they render themselves unable to include the scientific in a social analysis.

In *Risk and Culture* (1982), Mary Douglas and Aaron Wildavsky took an important step in overcoming this problem by describing variations in responses to nuclear risks as the product of contrasts among distinct cultural "cosmologies." But their underlying theory of logical social determinism combined with a neo-conservative political agenda led them to omit science from the cosmologies they described. This article presents an alternative view of the American conflict over nuclear power as an instance in the historical competition among contrasting American ideologies, describing ideologies as implementing cultural categories of meaning rather than reflecting social organization. Three different classifications appeared in sequence, establishing both pro-nuclear and anti-nuclear iden-

tities for the individuals and groups involved. Science participated as an integral part of the ideological debate by serving as a cultural source of epistemological authority.

The analysis begins with an exploration of Douglas and Wildavsky's argument, followed by an account of the historical evolution of the American conflict over nuclear risks, and concluding with a discussion of the relationship between risk selection and scientific knowledge about "nature" in American culture.

Nuclear Risks and Organizational Structure: Douglas and Wildavsky

Douglas and Wildavsky's (D&W) account of the American dispute over nuclear risks gives analytic priority to the structure of American society, which consists of two societal locations occupied by four types of social organization. At the "center" of society are found "individualist," or market-oriented, organizations, as well as "hierarchist," or bureaucratic, organizations. At its "border" stand "sectarian," or voluntary membership, organizations, which are subdivided according to whether their institutions are "hierarchist" or "sectarian" in structure. In the conflict over nuclear power, the nuclear industry and the federal government were both examples of hierarchist organizations at the center, while groups opposing nuclear power through legal or extra-legal methods were sectarian organizations at the border.

Connections between organizational forms and responses to nuclear risks were logical rather than causal in nature. The contrasting structures logically determined distinctive "cosmologies" of the same name, which, in turn, determined corresponding patterns of acceptance or avoidance of nuclear risks. As D&W wrote in generalizing about this mechanism of risk selection,

> Once the idea is accepted that people select their awareness of certain dangers to conform with a specific way of life, it follows that people who adhere to different forms of social organization are disposed to take (and avoid) different kinds of risk. To alter risk selection and risk perception, then, would depend on changing the social organization. [1982:9]

The nuclear industry and federal government, which were analyzed only briefly, accepted nuclear power because "both risk portfolios can carry a large amount of long-term, low probability risk" (1982:100). As hierarchist organizations, their major concern was to preserve societal stability, which was more threatened by high probability risks than long-term risks. Small-scale sectarian groups, however, were greatly threatened by the risks of nuclear power, because "their values will be against big technology, big industry, as well as big organizations" (1982:139). Accounting for the nature and implications of sectarian opposition to nuclear power became the major project of the book.

The cosmological responses of sectarian groups varied with their institutional structures. The Environmental Coalition on Nuclear Power, for example, was a Pennsylvania group that opposed nuclear power by legally "intervening" in the federal licensing hearings of individual plants. It exhibited a hierarchist

institutional structure through its organization around "a central core of committed local members" who assumed leadership by "[taking] on the leading roles in promoting local opposition to nuclear plants" (1982:148–149). As a logical derivation of this structure, the organization acted as a "reformist" group that "accepts the established legal channels as appropriate for fighting the anti-nuclear battle" (1982:149). Its concern about the technology was simply that "local residents do not have an adequate say in the siting of nuclear reactors" (1982:149).

In contrast, the Clamshell Alliance was a New England group that protested nuclear power through extra-legal methods of nonviolent direct action. It possessed wholly sectarian institutions, exhibiting a radically egalitarian structure that explicitly sought "to prevent the emergence of individual leaders" through such devices as a rotating facilitator at meetings, consensus decision making, spokespersons with no representative authority, and a small-unit structure of affinity groups (1982:148). The cosmological consequence of this structure was that the Clamshell "reject[ed] the existing social system as unworkable or fundamentally unjust," viewing all economic and social ills as stemming from the distribution of energy in favor of large corporate and governmental interests" (1982:149,150). And their "aim in blocking nuclear power" was "not merely to safeguard themselves from the possibilities of exposure to hazardous radiation but to break the stranglehold which they consider such interests to have on society" (1982:58).

A significant strength of D&W's theoretical approach, which is rooted in the British school of social anthropology, is that it does not classify cosmologies as necessarily irrational, thus introducing the possibility of analyzing scientific knowledge claims as cosmological phenomena (although I am not sure how logical derivations could be traced between group characteristics and individual scientific claims). But in order to realize an additional objective of rejecting the sectarian alignment as a threat to social stability, D&W instead characterized the cosmologies as decidedly nonscientific in content.

The book opened promisingly by finding the distinction between objective and perceived risk to be an analytical dead end in risk analysis. It then advanced the anthropological model as one that "puts any normality under scrutiny" (D&W 1982:35). The early discussion appeared to suggest that even science might be described in cosmological terms: "We modern people see things differently precisely because we share an empirical, evidential, scientific ethos" (1982:14). If so, the appeals to science for knowledge claims that border groups, center groups, and even risk assessors make would all be subject to scrutiny without prejudice, for "blameworthiness takes over at the point where the line of normality is drawn" (1982:35). But D&W ceased this line of argument as later chapters left the modern scientific ethos unanalyzed. Rather than overcoming the "inappropriate" distinction between objective scientific calculation and individual subjectivity by viewing both in cultural terms, they located culture in an unoccupied slot *between* them: "between private, subjective perception and public, physical science, there lies culture, a middle area of shared beliefs and values" (1982:194). As Boon (1983:102) observed with some disappointment, "they are not inviting us to acknowledge that science is arbitrary too, just like cultures."

D&W also appeared to draw a line of normality by asserting that "unbridled" sectarian action was a danger to social stability (1982:184). The type of group most threatening to society was represented by the Clamshell Alliance, which they described as a quasi-religious organization that, because of its structure and location, "needs enemies," sees "evil everywhere," "rejects worldly behavior," has members that necessarily "defame" each other, and produces "sermons" that "harp on defilement and purging" (1982:121–124). While its creation may have provided a check on the potential excesses of industrial and governmental groups at society's center, its success in stopping nuclear power could have led to such unwanted societal dysfunctions as "neglect of the technical and institutional apparatus of political life," "enhanced conflict over the distribution of a smaller pie, without a cohesive center to moderate the resulting disputes," and, most importantly, increased risk to the individual of "being classified as evil, a malefactor outside the protection of the law" (1982:182,184). The alternative they favored was continued dominance by the center and its institutions, because "since we do not know what risks we incur, our responsibility is to create resilience in our institutions" (1982:198). Since knowledge claims accrued significance only in terms of the functional metric of social stability, all were necessarily pure secondary rationalizations. But since anti-nuclear groups threatened social stability, their claims about nuclear power could be judged nonetheless as bad for society, while the stability-maintaining claims of the pro-nuclear center were necessarily good.

It is instructive that D&W did not examine the structures and cosmologies of any of the dozens of voluntary pro-nuclear groups that formed on the right wing of the political spectrum, such as the Concerned Citizens for the Nuclear Breeder, Americans for Rational Energy Alternatives, New Hampshire Voice of Energy, Massachusetts Voice of Energy, Grass Roots Energy Alliance Team, and Americans for Nuclear Energy. Identifying them as sectarian groups would have undermined the whole theoretical enterprise of connecting group organization to risk selection, because their pro-nuclear alignment opposed that of the other sectarian groups. And characterizing each as a covert extension of center hierarchy would have suggested that their claims about nuclear power were nothing more than defensive manipulations, thus also undermining the argument by casting unwanted epistemological doubt on the pro-nuclear alignment. Finally, giving explicit consideration to the epistemological authority of science would probably have forced a less definitive discrimination between the opposed alignments than D&W were inclined to make.

Yet their own analysis contains the seeds of a view that knowledge claims based in science constitute an integral part of the cultural process of risk selection, and that risk selection is not a logical product of social organization. Firstly, D&W took pains to point out that the American cultural selection of risks involves choice from a set of "real" risks, even though they avoided the issue of physical reality by asserting that a multitude of real risks exists for cultural selection:

> Cultural analysis shows us that ideas about pollution are not sufficiently explained by the physical dangers. *These are real enough and there are plenty of them.* Out of all

> the possible ill results, a certain selection of troubles is made particularly sensitive to a particular set of moral faults. [1982:38, emphasis added]

But if risk avoidance is fundamentally a cosmological device for holding a group together, why is risk selection not simply a ritual process that is totally unrelated to the physical reality of the dangers involved? By reassuring their native American readers that the subsets of risks they select are real, D&W have implicitly incorporated a culture-specific notion of reality as a presupposition of American risk selection. Secondly, their concluding discussion of the Clamshell Alliance raises a question about the directionality of the organization-cosmology connection: "Most members of direct action alliances joined *because of their opposition* to nuclear power, both as a technology and as the manifestation of undemocratic unresponsiveness to individual needs within American society" (1982:149; emphasis added). But if Clamshell members joined the organization because of a prior opposition to nuclear power, then perhaps the voluntary Clamshell organization itself presupposed the anti-nuclear cosmology, knowledge claims and all, rather than producing it. And if that is the case, in order to account for the knowledge claims of groups involved in the nuclear dispute, we should be examining their roles *within* cosmologies.

The following interpretation of pro-nuclear and anti-nuclear responses to nuclear risks examines the competing cosmologies as different ideologies that drew upon a common pool of categorical distinctions in American culture to provide contrasting "schematic images of social order" (Geertz 1973:216). Each ideology structured either pro-nuclear or anti-nuclear action by contributing to the cultural identities of individuals and groups whose experience included the technology. As Galaty (1982:3) observed, an ideology "provides a mode by which a stable and coherent image of the . . . cultural . . . self can be publicly presented, thus establishing continuity of identity through perpetual reproduction of that image."

The Initial Ambiguity: Atomic Energy and Progress

Actions by government and industry to accept the risks of nuclear power have been structured in part by an ideological connection between technological advancement and national progress. National progress is construed in this ideology in individualistic terms, where the "individual" is, in American culture, understood to be a monad free from control, ownership, or, in general, "possession" by other such monads (Macpherson 1964). That is, the ideology links itself to institutionalized understandings of the "nation" as a collectivity of free and, therefore, equal individuals (Dumont 1970); of the "economy" as the domain of activity in which individuals freely pursuing self-interests simultaneously advance the interests of the collective whole; and of "government" as the objectification of the national collectivity of individuals in a single actor whose democratic actions thereby represent the whole. The linkage produces a view of national progress as a process constituted by enhanced individual freedom manifest in increasing economic standards of living and facilitated by democratic govern-

ment. The ideology makes progress a responsibility as well as an effect of economic activity by also drawing upon the American view of kinship relationships as structured by "blood" relations, or "shared substance" (Schneider 1968). That is, by connecting succeeding generations through shared blood, such that future generations exist in the present in the form of unrealized substance, American culture gives each generation control over the next. In progress terms, each becomes responsible for preserving the freedoms of following generations by maintaining a high standard of living and a nation secure from outside threat. The ideology brings technology into its model of social order by means of the cultural distinction between "man" and "nature," whereby "nature" is understood as an internally ordered physical (rather than spiritual) whole distinguished from the realm of "man," and "technology" is the means by which man achieves manipulative control over nature. Technology becomes linked to progress in that continual increases in the technological control of nature become essential to the enhancement of individual freedoms within the American nation.

The progress ideology has a long tradition of dominance in the cultural history of the American nation. In the nation's early years, Americans relied upon the technology-progress connection to distinguish themselves from their English ancestry. Struggling to create a democratic tradition that would contrast sharply with the inequities of English society and the evils of its industrial revolution, they looked to technology to provide "the physical means of achieving democratic objectives of political, social, and economic equality" (Meier 1957:618). Throughout the 19th century, Americans both in and out of government experienced the "thrill of the technological transformation" (Miller 1965) as a host of technologies developed through the incentives of market competition, including the steamboat, steam locomotive, telegraph, and electric power. These new technologies were seen as providing the greatest good to the greatest number by improving transportation, enhancing communication, saving labor, and transforming the wilderness of nature into the "middle landscape" of "the machine in the garden" (Marx 1964). Engineers and entrepreneurial technologists became national heroes, such as John Roebling (designer of the Brooklyn Bridge), John Jervis (builder of the Croton Aqueduct, which brought spring water to New York City), and Thomas Edison (often voted as America's "greatest citizen" in opinion polls before 1920). And America's growing political, economic, and military power in the world both validated its formula for progress and suggested to its citizens that the formula was applicable worldwide.

Twentieth century technologies brought greater control over nature, but their increased scale also introduced unprecedented ambiguities into the ideological connection with progress. World War I demonstrated "the terrible destructiveness of modern military technology" and raised in stark form the question of "whether military technology would end war or end the race" (Hughes 1975:5–6). Greater recognition of the social inequities of mass production in modern capitalism, involving in part concern about the effects of mindless technological tasks upon the worker's sense of achievement, produced increasing struggles between labor and management. And the idle factories and massive unemployment of the

Great Depression provided clear evidence that the link between modern technology and progress was not automatic. The growing list of negative effects left technology increasingly problematic for the progress ideology, and alternative classifications of its role in society, such as complaints by political liberals about insufficient societal control and by Marxists about capitalist alienation, began to appear more plausible.

Atomic energy initially developed against this background of a long-dominant ideology of progress through technology that was complicated by more recent ambiguity. The secret wartime development of atomic weaponry had been readily accepted by participating scientists and government officials as necessary to preserve the integrity of the nation from external threat: national progress could not occur without a nation. The physicists had announced that manipulative control over the atom was possible, and America therefore had to develop the capability before Germany did. But by providing convincing evidence of both the potential of ultimate world progress through the limitless harnessing of nature's energy and the risk of ultimate regress through the total destruction of both man and nature, atomic energy was a maximally ambiguous technology for most members of American culture. Consequently, it became a difficult policy problem.

Shaping Organizations to Maximize Progress

The American government at this time had a cultural identity structured by the combination of an institutionalized responsibility for representing the national collectivity and an ideological commitment to progress.[1] Congress struggled over how to organize the future development of atomic energy, seeking some way to minimize the risk of catastrophe and capitalize on the promising link to progress. Having already shown itself capable of using the technology for destructive purposes against another nation, America was particularly interested in realizing the potential of global progress, or, as President Truman put it, to "make a blessing" of it (quoted in Ford 1982:31). The policy that emerged in the form of the Atomic Energy Act of 1946 sought to reduce the risks by establishing civilian control over all developments, and to maximize the benefits by making peaceful developments an explicit objective of government: "the development and utilization of atomic energy shall, so far as practicable, be directed toward improving the public welfare, increasing the standard of living, strengthening free competition in private enterprise, and promoting world peace" (U.S. Congress 1946:Sect. 1).

A group of physicists who had participated in the Manhattan Project and had long cooperated in an international community producing knowledge about nature for the betterment of mankind, actively joined the debate. They argued that the risks of atomic energy made the nation an anachronistic concept and that the technology should be subject to international control, or even world government. Congress disagreed, seeking instead to minimize the risks to the American nation in particular. It prohibited the sharing of classified information and made peaceful developments "subject to the paramount objective of assuring the common defense and security" (U.S. Congress 1946:Sect.1).

In order to systematize simultaneous pursuit of the institutionalized objective of national preservation and the ideological objective of international progress, the act created two wholly unique governmental organizations with interests that directly reflected those objectives. The Atomic Energy Commission was established as an executive agency with "exclusive . . . ownership of fissionable materials and the facilities for their use or production," which gave the government unprecedented authority over a technology with commercial applications, "a virtual monopoly over the development and exploitation of peaceful applications of atomic energy" (U.S. Congress 1946:Sect. 1). As a civilian organization independent of presidential control, and as both the promoter and regulator of atomic energy, the agency was also structured to be free from the vagaries of military interests and partisan politics. But in order to insure that the AEC did not develop its own agenda apart from the national collectivity, the act also created the Congressional Joint Committee on Atomic Energy and granted it the right to be "fully and currently informed" of AEC activities (U.S. Congress 1946:Sect. 15). The JCAE was also insulated to an unusual extent from partisan politics. Not only was it the only Congressional committee ever created by law and the only joint committee (membership from both the Senate and the House of Representatives) ever authorized to originate legislation, it was actually given complete jurisdiction over "all bills, resolutions, and other matters . . . relating primarily to the Commission or to the development, use, and control of atomic energy" (U.S. Congress 1946:Sect. 15).

No one, save the physicists, questioned the concentration of authority in these two organizations, for the centralization appeared to most to be in the best interests of national progress. Any more decentralized arrangement would have required greater understanding of likely future technological developments and ideological tensions than existed at the time. The presence of significant uncertainty overcame virtually all doubts about the legitimacy of government working to develop commercial technologies.

Avoiding the Risk of Communism

But this national program of peaceful uses for supranational ends languished until the demonstration of contributions to world progress became essential to the nation's institutionalized interest in self-preservation. The ideological component of America's postwar identity was being shaped by its competition with Marxism. When the Soviet Union unexpectedly detonated an atomic bomb in 1949, "the sense of shock in this country, particularly since China had just fallen to the Communists and the Hiss trial was making headlines in New York, was immense" (Green and Rosenthal 1963:9). Communists seemed to be getting into everything. Weapons developments received top priority as the JCAE and the AEC worked closely together in mapping an "all-out crash program for the development of the hydrogen bomb" (Green and Rosenthal 1963:9–10). Growing anti-Communism also ignited the government's atomic power program when European nations with unreliable politics began to adopt aggressive reactor development programs to

overcome their shortages of fossil fuels. America elected to respond in kind in order to stem the tide of Communist expansion (Bupp & Derian 1978).

The JCAE's chairman, for example, saw atomic power development as a major part of the "battle for the minds of men," and argued that "we must show ourselves and the world that the vigor of America continues to lead the way to a decent standard of living today, tomorrow and always for us and for our friends" (Cited in Dawson 1976:54). And the AEC formally sought an expanded effort in power development to prevent a loss of American "leadership":

> We believe the attainment of economically competitive nuclear power to be a goal of national importance. Reactor technology has progressed to the point where realization of this goal seems achievable in the foreseeable future if the Nation continues to support a strong development effort. It would be a major setback to the position of this country in the world to allow its present leadership in nuclear power development to pass out of its hands. [U.S. Atomic Energy Commission 1953:19]

In other words, demonstrating that reactor technology could flourish under the American system of private enterprise, by increasing standards of living and enhancing individual freedom, became an instrumental means for preserving the nation against Marxist intrusion.

Of major concern to the nuclear developers was whether or not the technology would "work," i.e., be competitive economically with existing sources of electricity. A number of barriers stood in the way of a successful private industry, including uncertainty about the best reactor design, materials problems, a shortage of uranium, and projected high capital costs. Supporters of nuclear power argued that government assistance would make it possible for industry to overcome these barriers and enable the technology to shift wholly into the commercial sector at some future point.

Through aggressive action by the JCAE, Congress in 1954 granted private industry the authority to own nuclear facilities and to possess and use nuclear materials. It also funded start-up assistance in the form of government-sponsored research and development, inexpensive fuel, limits on industry liability in the event of an accident, and direct subsidies for "demonstration" plants. The AEC implemented these policies by establishing a division of labor that limited its responsibility to conducting basic investigations of potential future technologies and shifted to the nuclear industry (e.g., General Electric, Westinghouse, Babcock & Wilcox) the task of systematically exploring the engineering features of the design. The two worked together in convincing utility companies that use of this government-sponsored technology was wholly consistent with their identities: it not only contributed to national progress but also served their private economic interests. The AEC's chairman was particularly optimistic, foreseeing future generations as benefitting from a technological utopia:

> Our time scale can fold like an accordion. Transmutation of the elements, unlimited power . . . these and a host of other results all in fifteen short years. It is not too much to expect that our children will enjoy in their homes electrical energy too cheap

> to meter, will know of great periodic regional famines in the world only as matters of history, will travel effortlessly over the seas and under them and through the air with a minimum of danger and at great speeds, and will experience a life span far longer than ours. . . . This is the forecast for an age of peace. [Strauss, cited in Ford 1982:4]

The utilities remained skeptical until 1963, when the nuclear industry accepted a mammoth economic risk by offering nuclear plants at guaranteed prices. The strategy worked, triggering a "bandwagon market" that continued even after the offers were discontinued (Bupp & Derian 1981:42–55). Utilities competed with one another to get a strong foothold on what now appeared to be the generating technology of the future, placing a total of 78 orders by 1967 and 254 orders by 1977 (Bupp & Derian 1981:42–55).

Accepting Risks to Health and Safety

Potential risks to health and safety were a lesser concern than the risk of losing national freedom. Health and safety risks were always a necessary consideration, for power plant technology could not be progressive in any sense if it constrained the individual freedoms of the citizenry by imposing on them unacceptable hazards. But nuclear hazards were viewed more as outstanding problems to be resolved as the technology developed than as potentially serious weaknesses that had to be removed prior to development, primarily because they were thought to be negligible in magnitude. The supreme scientific virtuosity that had produced the atomic bomb also provided convincing evidence that the mere engineering problems involved in nuclear safety would be amenable to solution, and would, in fact, be solved by an industry acting in its self-interest. The nuclear industry was systematically applying the concept of "defense-in-depth," adding layers of back-up safety systems that would either prevent a serious accident or contain the damage if one occurred. The only internal difference of opinion was over whether nuclear power was "inherently safe" in an absolute sense or its likely hazards were not significant enough to slow the technology's development and risk losing international leadership. With safety problems at most a secondary concern and the goal of national progress through private developments defining its organizational identity, the AEC placed few regulatory constraints on the industry, demanding only "reasonable assurance of adequate protection to the health and safety of the public" in the licensing process (U.S. Atomic Energy Commission 1954).

Yet during the 1960s, the number of not-yet-solved problems began to increase as plant sizes expanded sixfold, construction of the custom-designed plants became more complicated, and operating experience brought new knowledge of new engineering problems. An advisory committee to the AEC (which came to be known within the organization as the "Brake Department") alerted it to a number of potential safety problems, especially those that might contribute to a catastrophic accident; and outside groups began to oppose individual plants by intervening in their licensing hearings. The licensing process became the critical arena

for risk assessment, for by granting a license to a plant, the AEC thereby labelled it for society as adequately safe.

The AEC turned to science for evidence of nuclear safety, for in American culture, science is the ultimate source of epistemological authority. Scientists are the high priests of nature, for claims that are valid according to the methodological principles of science are most likely to attain the unchallengeable status of "facts" about nature. In scientific terms, the risk of a catastrophic accident is computed as the product of the magnitude of its likely consequences and the probability of its occurrence. Much to the AEC's dismay, however, contracted scientific research showed that the likely consequences of the worst-case accident were quite high and that insufficient operating experience had been accumulated to calculate statistically significant probabilities. In other words, incontrovertible scientific substantiation was impossible. But the research also showed that no decisively negative evidence about the probability of an accident existed either. So although official legitimacy from science was not forthcoming, the AEC continued to point to the industry's engineering safeguards as providing evidence that nuclear risks were likely to be negligible. The agency's official policy for licensing purposes was that a core meltdown and catastrophic release of radiation was an "incredible event," and hence not subject to deliberation.

By 1970, America had successfully reproduced its identity as the world's leader in nuclear power, as the domestic industry was growing rapidly and both European and developing nations had become almost totally committed to American technology. The new decade would bring a dramatic expansion in public concern about nuclear risks, but it also brought a new justification for the proponents of nuclear power. The Arab oil embargo and rising oil prices of 1973 issued a challenge to the American nation that equalled the impact of Russia's atomic explosion. National autonomy was now threatened by energy dependence on foreign nations, and the continued development of nuclear power became essential to achieving American independence. From that point on, nuclear risks no longer needed to be small in absolute terms for the technology to remain progressive, only small in comparison to those posed by the limited set of commercially available, i.e., progress-producing, alternatives. Thus throughout the later 1970s, nuclear power became America's technological ticket to national independence and continued progress for the entirely new reasons that oil was foreign, coal was hazardous, and solar was commercially infeasible.

The Second Connection: Polluting Nature and an Imbalanced Collectivity

The progress ideology did not accurately frame everyone's experience of nuclear power in American culture. Actions by voluntary groups that formed in the late 1960s and early 1970s were structured by a different ideological perspective that involved a connection between the pollution of nature and an imbalance in the collectivity of individuals constituting the nation. This ideology drew upon the same background of cultural categories as the progress ideology, but "resolved" the ambiguity of modern technology by implementing the categorial dis-

tinction between man and nature in a new way. In American culture, man is not only opposed to nature but also is encompassed by nature as a constituent element. During the 1960s, the effects of industrial emissions on the air and water of nature appeared to be rapidly increasing, in part because of science's rapidly expanding ability to detect the presence and pathways of those emissions. Instead of interpreting the emissions as an unfortunate by-product of man's domination over a separate nature, it became increasingly plausible to view them as an instance of man's pollution of the rest of nature. As one long-time resident of Chicago later communicated this identity in an interview, "When I was a child, driving past the billowing smoke of the steel mills in Gary [Indiana] inspired pride in America's strength. Now the smell sickens me."

According to the new "environmentalist" ideology, the pollution of nature produces an imbalance in the national collectivity rather than progress when it impairs the exercise of "lifestyles" (Nader and Beckerman 1978) that involve interacting with a nature free of technological "dirt" (Douglas 1966). That is, polluting technologies contribute to the freedoms only of those individuals who benefit from their use, while inhibiting the freedoms of those who bear the costs. As a consequence, any action, or inaction, by the government that contributes to technological pollution is inconsistent with its identity as the nation's actor because it thereby permits one subset of the collectivity to infringe upon the freedoms of, or to possess, another subset. The only solution to this problem is positive governmental action that redresses the infringement by balancing the interests of the collectively. This usually involves modifying the technology to reduce the hazard as much as possible without halting the technology completely, for such would constitute an equally illegitimate infringement on the freedoms of its developers.

The appearance and development of the new ideology was actually an extension of a longer tradition of political liberalism in American culture. Throughout the nation's first century, liberalism referred to the laissez-faire style of government that functioned only to preserve order in the competition among free and equal individuals, acting as little more than a policeman and a judge. During the late 19th century, however, the development of large corporations and inter-corporate trusts was interpreted by many as "Europeanizing America by creating 'trust serfs' who could never be free" (De Leon 1978:58). These dissenters reasoned from the perspective that preserving individual freedoms and America's democratic identity demanded a more active role by government, for only government could act to preserve a balancing of interests. In the 20th century, the new perspective became increasingly institutionalized alongside laissez-faire liberalism, now reclassified as conservatism. Government created a growing system of business regulation that sought to achieve balance while avoiding the risks to freedom posed by centralized governmental control. Although the new form of liberalism became politically dominant during the New Deal, technological developments were still organized in the progress terms consonant with conservatism, even, as shown above, government-sponsored nuclear power. Thus when environmentalism developed during the 1960s as a voluntary movement outside

of government seeking government action to represent its interests, it constituted a novel attempt to extend 20th-century liberalism into the new arena of industrial emissions by attempting to institutionalize a liberal account of their production and effects.

Nuclear power became the subject of classificatory debate about its role in relating man and nature when the technology's rapid development during the late 1960s entailed the siting of large numbers of plants in areas remote from large population centers. Few people were aware of the AEC's developing knowledge about health and safety risks, but much scientific information was available about the potential negative effects of disposing of waste heat in lakes and rivers and of routinely releasing small quantities of radiation into the environment. Collections of local residents with a cultural identity comprised of upper-middle class status and a commitment to environmentalism drew upon this information to reclassify nuclear power from a benign machine in the garden facilitating progressive liberation to a new source of freedom-constraining pollution. They joined together into small groups and coalitions and opposed the siting efforts by intervening in the licensing hearings of individual plants.

It is important to recognize that environmentalist intervenors needed scientific evidence about risks to the environment to warrant and validate an ideological reclassification of nuclear power. Nuclear power could not be unprogressive, i.e., restrict the freedoms of those with an interest in nature, if it did not pose hazards to nature. In addition, note that the presence of nuclear hazards demonstrated only that the interests of intervenors were negatively affected, without justifying a deeper challenge to the legitimacy of government. Achieving public acceptance, and hopefully institutionalized recognition, for their cultural identity as underrepresented interests therefore required showing only that adverse impacts existed and were not receiving official consideration. Establishing the severity of those impacts was not essential. Thus when evidence about potentially catastrophic risks to health and safety finally became available publicly during the early 1970s (cf. Gillette 1972a, 1972b, 1972c, 1972d), those claims were merely integrated into successive proceedings as further evidence of an imbalanced collectively, rather than motivating yet another reclassification of nuclear power.

Avoiding Imbalance in Indiana

One coalition of local groups in 1972 intervened in the licensing hearing for the Bailly nuclear plant, which was to be built in northern Indiana along the shoreline of Lake Michigan east of Gary and adjacent to the Indiana Dunes National Lakeshore. The utility company had named the plant after the first European settler in the area, who had initiated local progress just as they were now reproducing it. The lead intervenor was a local chapter of the Izaak Walton League, a hunting and fishing organization, which expressed concern about having to bear "serious and adverse effects of radiation release and thermal discharge" in and around the Lakeshore "without . . . having a voice in the planning and resolution of safety and environmental questions. . . ." (U.S. Atomic Energy Commission 1972:3).

Also participating was the Concerned Citizens Against the Bailly Nuclear Site, which local residents had formed "specifically to contest issues of nuclear safety and radiological and environmental protection . . . insofar as their interests may be adversely affected" (1972:3). Joining them was Business and Professional People in the Public Interest (BPI), a law firm that had participated in interventions at other nuclear plants. Together with a number of individuals, they entered the licensing hearing as the Joint Intervenors.

The purpose of the hearing was to determine if the plant's design met the Atomic Energy Commission's regulations, a prerequisite for granting a construction permit. The hearing lasted thirteen months, building an oral transcript of 11,000 pages, as both sides brought in expert witnesses to support or challenge the 68 factual "contentions" filed by the intervenors.

For the intervenors, the dispute over Bailly extended a long-standing controversy over the future of the Dunes area in northern Indiana. Since the 1920s, local residents whose "major concern was the prevention of industrialization and urbanization in the shoreline and Dunes area" (Mayer 1964:413) had battled with industries seeking to expand the substantial steel-making capacity of the region. Creation of the National Lakeshore in 1966 was the product of 14 years of lobbying by local residents through the Save the Dunes Council, Inc., a local voluntary organization that claimed itself to be one of the nation's oldest environmental groups. The interests of Council members in preserving nature were not only recreational and aesthetic but also linked to property interests in their homes, which had been chosen in the first place because of their proximity to the sand dunes. The Congressional solution that finally produced the park was predictably a compromise measure. It balanced the progress-seeking interests of the industry against the environmental interests in unspoiled sand dunes by dividing the available land equally between the park and the mills.

Most advocates of the Lakeshore initially favored construction of a nuclear power plant because they saw it as posing lesser environmental risks than a coal-fired plant. Reported one prominent intervenor in a field interview:

> I even made a speech in favor of it. [Coal emissions] . . . contained fly ash, particulate matter, invisible S02 and S03 and all the other traditional pollutants, and I said to myself that anything must be better than that. But then I didn't know anything about nuclear power plants.

Local opposition first developed when "the National Park Service raised the red flag and rang the alarm bell" by presenting evidence in the park's master plan about the "adverse environmental impacts" of the nuclear plant. The local shift in alignment was merely a reclassification of nuclear power in terms of the environmentalist ideology, based upon the new knowledge:

> Those people who were interested in saving the Dunes were also interested in preventing adverse impacts from any source. . . . Obviously, if you were in favor of the Lakeshore you were in favor of reducing or eliminating adverse impacts, so consequently you would support the intervention. . . . The core group of opponents to the

> nuclear power plant ultimately became the same group who had been in favor of the National Lakeshore.

The Joint Intervenors never explicitly opposed nuclear power in a generic sense. Rather, as was the case for all intervenor groups during this period, "the Bailly problem," as another member put it, "is largely a siting problem." That is, the polluting effects of a nuclear plant depended upon the kind of environment that surrounded the site. But it was also true that, since all sites were in remote locations, all plants posed some degree of environmental hazard. Still, a number of earlier interventions, including those at other sites along Lake Michigan, had been resolved when intervenor concerns about thermal pollution were met by redesigning the plants to include cooling towers for disposing of waste heat. Thermal pollution was not an issue at Bailly, but the planned cooling towers themselves became a potential source of pollution as intervenors argued that the water vapor from its plume would mix with sulphur oxide emissions from an adjacent coal-fired plant and produce the misting of sulphuric acid onto the ecosystem of the Lakeshore. Other key knowledge issues involved similar site-specific assertions about technological dirt spoiling nature, such as the potential effects of radioactive emissions on the local biota, leakage from on-site waste storage facilities, visual pollution of the park by the 550-foot cooling tower, and potential water drainage from Cowles Bog, a national landmark identifying the location where the nation's first ecologist had conducted his studies (U.S. Atomic Energy Commission 1972).

The intervenors' objective was not to prevent the pollution of the Lakeshore at all costs but to insure that their interests in the natural environment would receive equal consideration with industrial interests in the government's decision making. "We are not decision makers," said the first informant. "We are just advocates. We believe in the American way; that is that all points of view must be expressed before a good decision is made." In similar fashion, a representative of BPI explained that only government can represent the public interest as a whole, but that his group worked to produce that end by forcing the government to balance the collectivity by giving consideration to underrepresented interests:

> The public has an interest in the Dunes, which are unique in the world, and in protecting the lives and health of the people; the Izaak Walton League is doing its job of making sure that those interests are given careful consideration. . . . And whichever way the decision ultimately goes, the public interest will have been served (Dorfman 1979:22,20).

The Joint Intervenors thus accepted the inherent legitimacy of fully representative governmental decisions: "For in the end it is in maintaining the integrity of the *process* of public decision making that the general interest lies" (Dorfman 1979:22; emphasis in original).

By classifying nuclear power as an instrument of imbalance and its own actions as restoring balance, the Joint Intervenors exhibited an ideological identity that accepted democratic representation as an organizational structure. Carrying

on a legal intervention required almost daily communications outside the group over a period of nearly five years. Yet the group only met as a whole every several months, or, as the second informant put it, "as needed." That is, each member was free to act for the group on issues on which a collective agreement had been established. But in plotting long-range strategy or addressing totally new issues, a majority opinion was necessary to select actions that accurately realized and maintained the group's cultural identity.

The Bailly intervention did not prevent issuance of the construction permit. That outcome was not unexpected, for none of the few dozen interventions during the late 1960s and early 1970s ever stopped the licensing of a plant. The intervenors had reproduced their cultural identity to their own satisfaction by simply participating in the process. But by failing to prevent nuclear development through legal means, they also contributed to legitimizing a completely new form of environmentalist opposition to nuclear power, which developed in the mid 1970s.

The Third Connection: Polluting Nature and Domination

Actions by the new opposition were structured by a third ideological perspective that was no less American than the first two. This ideology drew upon the same background of cultural categories, but, in contrast to the liberal perspective of the earlier environmentalists, it connected the technological pollution of nature to the wholly illegitimate possession of one subset of the national collectivity by another. That is, man dominates man by polluting nature. When classified by this ideology, government stands as a public organization linked to and serving corporate interests. It invalidates its own legitimacy as the embodied collectivity by tolerating domination through technological risks. The only solution to this domination is to replace the corporate-governmental establishment with a more egalitarian structure, through the sheer force of citizen demand. Taking "direct action" against the establishment therefore became a legitimate response as long as the action was nonviolent, for violence would merely reproduce the domination that justified the direct action in the first place.

The appearance of this ideology in the conflict over nuclear power was an extension of a longer tradition of "left libertarian" (DeLeon 1978) political radicalism in American culture, radical because it has never been formally institutionalized in the national system of governance. Left libertarianism appeared early in American history in anarchistic religious movements, such as the Oneida community, the Quakers, and the Shakers. But it first flowered in the late 19th century as an individualistic reaction to the growing power of the corporations and the increasingly centralized authority of the federal government. The perspective was realized broadly in quasi-syndicalist components of the labor movement, in the oratory and essays of Henry Demarest Lloyd, Edward Bellamy, Emma Goldman, and Eugene Debs, and in the mass organization of the International Workers of the World ("Wobblies"). It was then superseded by scientific socialism during the 1920s and 1930s. Although variants appeared among anar-

cho-syndicalist groups in the Spanish Civil War and in Gandhi's nationalistic movement in India, left libertarianism fell dormant in the United States until the 1960s, when it reemerged in the early years of the SDS (Students for a Democratic Society). It then spread within the movement against the Vietnam War, and became linked to the new environmentalism through the counterculture movement.

Nuclear power became subject to reclassification in left libertarian terms when it became clear both that the potentially catastrophic risks of nuclear power might not be negligible in probability and that liberal intervenors were incapable of stopping the technology. That the AEC continued to license plants in the face of large uncertainties about such risks could now be explained as the product of an unholy alliance with the nuclear industry in an atomic-industrial establishment. The government agency no longer represented the collectivity but had become part of a self-interested monolith that left the mass of citizens deprived of control over their lives by bearing the risks of the technology. The only way to stop this domination and replace the illegitimate government with a genuinely egalitarian organization was to stop the technology of nuclear power and then rebuild society by means of decentralized energy technologies, especially community-based solar power. An act against nuclear power became an act against domination.

Avoiding Domination in New England

The new opposition first appeared in 1973, when a group of veterans of the anti-war movement, who were living "an alternative rural lifestyle free from both the . . . capitalist society and . . . the hierarchical excesses and male chauvinistic failures of the New Left" (Mitchell 1981:82), opposed the construction of a nuclear power plant in Montague, Massachusetts. They sought to stop the plant through the novel techniques of rallies, picketing, vigils, and nonviolent civil disobedience. When the Montague plant was postponed indefinitely in 1976, this group turned its attention to the newly approved Seabrook plant, and, along with a number of other New England groups interested in direct action, formed the Clamshell Alliance.

Actions by the Clamshell Alliance, both in rejecting the risks of nuclear power and in establishing an organizational structure, communicated the ideological identity of a collectivity of citizens fighting domination. The Alliance's "Founding Statement" (Clamshell Alliance [CA] 1976), for example, began by asserting that "nuclear power poses a mortal threat to people and the environment"; that "energy should not be abused for private profit" and "people should not be exploited for private profit"; and that "energy needs can be adequately met through utilization of non-nuclear sources." It then situated the Alliance as a freedom fighter working to "stop all construction of a nuclear power plant in Seabrook, New Hampshire" and to "reassert the right of citizens to be fully informed and then to decide the nature and destiny of their own communities." Consistent with this role, the Alliance would oppose nuclear power through "direct, nonviolent action, such as one-to-one dialogue, public prayer and fasting, public demonstrations, site occupation, and other means which put life before property."

In similar fashion, the 600-word "Declaration of Nuclear Resistance" (CA 1977a) implicitly classified nuclear power as an instrument of domination while explaining why the Alliance was "unalterably opposed to the construction of this and any other nuclear plant." The purpose of the nuclear industry was "to concentrate profits and the control of energy resources in the hands of a powerful few, undermining basic principles of human liberty." Building a plant at Seabrook "could lock our region into a suicidal path," for the technology was "dangerous to all living creatures and their natural environment," an "assault on life itself." Nuclear plants were "an economic catastrophe," requiring "immense investments of capital" and creating "fewer jobs than comparable investments in conservation and solar energy." The export of nuclear reactors made possible "the spread of bombs to nations all over the world," while "the possibility of nuclear thievery and sabotage of nuclear facilities pose[d] further danger to our civil liberties and our lives." And the "centralized nature" of nuclear power "[took] control of energy from local communities and strengthen[ed] the monopoly of the utilities." Stopping nuclear power would make it possible for "power supply [to] be decentralized, so that environmental damage is further minimized, and so that control can revert to the local community."

An official history of the plant (CA 1978a:4–5) described the utility company as coming to "rape the land," force local people to "sacrifice their homes to the nuclear monster," "steal water," "increase rates," and "ignore home rule," all with the support of the government, which had "yawned and rubber stamped the project," "siding with the privately-owned electric power monopoly from the beginning." An early decision (CA 1979c) identified Alliance goals to "permanently halt nuclear power," to "promote democratic, public control over energy," and to "promote a pollution-free society in which the means and resources for satisfying basic human needs are controlled cooperatively by local communities." And a summary of plans for a protest action (CA 1978b) criticized the utility company for "blatantly refusing to accept responsibility for nuclear hazards" and established as its objective "to attempt to build an alternative community"; in "a world where individuals are often isolated, demoralized, and senselessly fight one another," they hoped to "maintain a presence that speaks self-sufficiency and community."

Classifying nuclear power as an instrument of domination could be acceptable in American culture only if the technology posed egregious risks to man, either directly or through the external environment. Thus, like the nuclear proponents and anti-nuclear intervenors before them, the Clamshell Alliance also turned to science for validation and legitimacy. Shortly after the formation of the Alliance, study committees spent months researching the problems of nuclear accidents, core meltdowns, low-level radiation, terrorism and sabotage, transportation, waste disposal, and nuclear economics, and then published pamphlets and articles detailing virtually every conceivable worst-case scenario (e.g., CA 1977b, 1977c, 1977d, 1977e, 1977f; see also 1976–79 issues of the bimonthly *Clamshell Alliance News*). One pamphlet summarized all the most damaging evidence against the Seabrook plant under the challenging title, "It's a Fact: Under-

standing the Seabrook Nuke." In addition, newly formed affinity groups often met as study groups in order to educate themselves about the hazards of nuclear power. Clamshell rallies always included experts to itemize the technical hazards, and each of the handbooks distributed at occupation attempts included a section on the "Dangers of Nuclear Power," as well as a list of eight to ten suggested books written by anti-nuclear experts (CA 1978a). Clamshell members themselves published two books that sought to document evidence about both nuclear hazards and official government misrepresentation (Gyorgy & Friends 1979; Wasserman 1979). Finally, group members often expressed concern about the importance of making defensible claims to achieving credibility for their classification of nuclear power, as in the following plea from one handbook: "It's important to know the basic facts and figures about nuclear power. Credibility can be easily damaged if it becomes apparent that you don't know what you're talking about or if you use incorrect information" (CA 1978a:24).

By classifying nuclear power as an instrument of domination, the Clamshell Alliance situated itself in society with an organizational identity that had two components. As part of a citizen's effort to stop nuclear power, the Alliance was an instrumental actor working to force changes in the establishment. And since the Alliance could not legitimately propagate domination while attempting to eliminate it, its internal organization also provided an egalitarian alternative to the hierarchy characteristic of everyday life. Instrumental as well as egalitarian, the Clamshell Alliance fought domination on both the outside and the inside.

The organizational process of consensus decision making was established at an early meeting in order to realize the Alliance's egalitarian identity in intraorganizational relationships. Whereas the Joint Intervenors had accepted informal majority rule because it provided balanced representation, the Clamshell Alliance took majority rule to be the manipulative dehumanizing form of authority that typified the establishment. Consensus, on the other hand, was a disciplined effort to allow the common ground to emerge that existed in a genuinely egalitarian collectivity: "Consensus allows us to recognize our areas of agreement and act together without coercing one another" (CA 1978c; see also CA 1979a). Although conflict was not to be avoided, the emphasis was on accommodation, as explained at a Clamshell workshop on consensus: "Under majority rule, when you and I disagree I try to convince you that I am right and you are wrong; under the consensus process, I try to accommodate myself to your objection" (Worcester, MA Feb. 1979). Its strictly horizontal structure was designed to prevent the internal development of domination. Rotating "facilitators" managed discussion (CA 1978b), while "vibes-watchers" managed its tone (CA 1979b). Accurate minutes by "note-takers" were valued because misrepresentation constituted an insidious form of coercion (CA 1979d), and "spokespersons" conveying local decisions to monthly "Coordinating Committee" meetings carried no representative authority in order to prevent vertical differentiation (CA 1979c). More than a 100% majority, any consensus decision constituted a collective achievement because it was the product of the group's unencumbered gravitation toward "collective truth" (CA 1979d).[2]

In parallel fashion, the use of nonviolent direct action to stop nuclear power established the Alliance's identity as both an egalitarian collectivity and an instrumental force for social change. Since "nuclear power is a violent technology," asserted one occupation/restoration handbook, "by opposing it nonviolently, we make it clear that the real nuclear terrorists are the people and institutions who perpetuate that technology, not those who work to stop it" (CA 1978a:14). Participants in protest actions were required to attend a five to seven hour training session on nonviolence, the highlight of which was the exercise of "role-playing," through which participants learned to overcome the boundaries of role distinctions by acting out the parts of their adversaries (CA 1978b). Direct action was necessary because it entailed "acting for ourselves without appealing to or recognizing the legitimacy of the state or corporate authority" (CA 1979c). The objective of civil disobedience, in which "laws are broken to prevent an injustice," was to undermine the popular support legitimizing the establishment and nuclear power by demonstrating a willingness to risk arrest, jail, and personal harm (CA 1978b). The goal of each Alliance action was to communicate two messages: "No Nukes" and "Nonviolence Works" (American Friends Service Committee 1977).

Throughout the late 1970s, over three dozen direct action alliances modelled on the Clamshell Alliance flourished across the country, growing in size, mounting frequent protest actions, and gaining national recognition. By 1979, the term "anti-nuclear" had become a referential label denoting the direct action style of opposition. Yet by the end of 1981, through a curious combination of success and failure, virtually all the Alliances had disbanded. The success lay in the fact that utility companies had stopped buying nuclear plants in 1977 and that, by the early 1980s, over 100 plants had been cancelled, including all those purchased since 1974. The technology thus fell into a state of decline as an instrument of corporate-government domination, even though the nation's use of nuclear power would almost double during the next decade. The failure had been that the movement was unable to achieve an egalitarian alternative to establishment domination, but no further effort was warranted because nuclear power no longer posed a threat. Instead, with the 1980 election of Ronald Reagan, the promise of increased defense spending, and the likelihood of a re-ignited arms race, nuclear weapons became subject to reclassification from an instrument of national preservation to an instrument of establishment domination, and the anti-nuclear power movement of the 1970s became the disarmament movement of the 1980s.

Conclusion: Nuclear Risk Selection and Knowledge about Nature

The American conflict over the risks of nuclear power developed as an historical sequence of conflicting classifications of the technology according to contrasting American ideologies, each of which fit into a longer political tradition in the cultural history of the American nation. The politically conservative progress ideology had given significance to technology throughout the nation's history as man's means for gaining control over nature and making himself free. Atomic

energy introduced risks that were anomalous in those terms, risks that could not be eliminated entirely even in an application explicitly designed for peaceful purposes. The anomaly was resolved by reinterpretations according to other available ideologies, including the liberal environmentalist and anti-domination perspectives, both of which classified the technology in terms of its implications for man as a part of nature rather than apart from it.

None of the ideological interpretations was a simple logical product of organizational structures or social structural interests. As the above examples showed, the unique responsibilities of the AEC and JCAE, the informal representative democracy of the Bailly intervenors, and the radical egalitarian structure of the Clamshell Alliance were all constructed to realize the cultural identities established by their ideologies.[3] Furthermore, the membership of each was but a subset of the population that shared their interests. Virtually the entire debate, for example, took place among members of the middle and upper-middle classes. Finally, the origins of the individual interests themselves often lay in ideologically motivated choices of lifestyle, such as a decision to buy a single-family dwelling near sand dunes, to join a corporation or a radical political movement, or to create a federal agency. Although it is plausible to suggest that individual participants in the nuclear dispute selected risks in a way that was consistent with their locations in society as a part of maintaining consistent cultural identities, those locations cannot plausibly be described as determining, either logically or causally, the differential ideological or, to return to Douglas and Wildavsky's usage, cosmological orientations.

Science did not stand apart from the American conflict over nuclear power as an analytically distinct phenomenon, but participated as a cultural source of authoritative knowledge about nature. The ideologies made nuclear power culturally meaningful, but, in American culture, any classification of technology in relation to man presupposes its classification in relation to nature. It is true that action involving technology is often premised upon knowledge claims other than those that are purely scientific. For example, the devastation of Hiroshima made atomic energy's ability to destroy nature eminently clear to a nonscientific population unfamiliar with atoms; the Atomic Energy Commission had no scientifically valid knowledge of the probability of a catastrophic accident, but its knowledge about the quality of engineering safeguards designed by the nuclear industry provided evidence for it to assert that the risks were negligible; and accumulating knowledge about actual unplanned releases of radiation and near-misses at nuclear plants suggested to nuclear opponents that the probability of a severe accident might in fact be significant. But the only unassailable means for any group in this conflict to establish its ideological classification of nuclear power as culturally valid was to locate claims that carried the epistemological authority of science.

Yet according to science's own self-limiting standards of reference, unambiguous accounts of events in nature are not always forthcoming. During the 1970s, debates among nuclear proponents and opponents frequently degenerated into mutual barrages of scientific facts as each side maneuvered in search of an

impregnable position. Nuclear power could never be progressive if it posed clear and present dangers, such as if a catastrophic accident occurred at every plant every year. Yet the technology could not be restrictive of freedoms if it clearly posed no hazards at all. But nuclear power is a case, similar to an increasing number of modern technologies, in which the types of hazard are sufficiently complex and the scientific uncertainties sufficiently great that no decisive scientific conclusions about risk could be reached. And so the battle continued as it began, a classificatory dispute among conflicting ideologies, with all sides invoking the authority of science but none entirely successful.

The conflict subsided without a decisive judgment about nuclear risks. Utility companies stopped buying nuclear plants because rapidly increasingly costs made their interests in technology for generating electricity no longer consonant with the nation's interest in nuclear power. As a result, government was removed, if only temporarily, from its position of either stimulating progress, causing imbalance in the collectivity, or exercising domination through efforts to develop nuclear power.

Notes

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[1]In this paper, I characterize the cultural identities of individuals and groups as constituted by relationships established in a combination of ideological and institutionalized meaning systems. Both draw upon a common pool of cultural meaning distinctions, and neither is analytically prior in the organization of action. Rather, the usual case empirically is that both attribute significance to given sets of action, such that individual actions typically convey webs of overlapping meanings. Actors generally convey meanings that are consistent with the various components of their identities, but contradictions frequently occur, producing a variety of decision-making dilemmas for the individuals and groups involved. I do not attempt here a microanalysis of the semiotic complexities involved in the communication of cultural identity in the nuclear dispute, which are nonetheless considerable. Rather, I use the distinction between ideological and institutionalized meaning systems to characterize the cultural identities of groups involved in conflict in order to overcome what is perhaps the most vexed problem facing students of American culture, that of systematic intracultural variation, or disagreement within a culture. See Silverstein (1985) for an analysis of how combinations of ideological and institutionalized systems of linguistic meaning marked speaker identities in 17th-century England.

[2]See Downey (1986) for a more detailed account of how the radically egalitarian identity of the Clamshell Alliance produced severe intraorganizational tensions that eventually led to the group's dissolution.

[3]The makeup of the AEC and the JCAE, of course, also had to be consistent with institutionalized prescriptions for the creation of governmental bodies, as codified in federal law.

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