



THE JOHNS HOPKINS
UNIVERSITY PRESS

The Rise and Fall of the Appropriate Technology Movement in the United States, 1965-1985

Author(s): Carroll Pursell

Source: *Technology and Culture*, Vol. 34, No. 3 (Jul., 1993), pp. 629-637

Published by: [The Johns Hopkins University Press](#) on behalf of the [Society for the History of Technology](#)

Stable URL: <http://www.jstor.org/stable/3106707>

Accessed: 13/06/2013 12:35

Your use of the JSTOR archive indicates your acceptance of the Terms & Conditions of Use, available at
<http://www.jstor.org/page/info/about/policies/terms.jsp>

JSTOR is a not-for-profit service that helps scholars, researchers, and students discover, use, and build upon a wide range of content in a trusted digital archive. We use information technology and tools to increase productivity and facilitate new forms of scholarship. For more information about JSTOR, please contact support@jstor.org.



Society for the History of Technology and *The Johns Hopkins University Press* are collaborating with JSTOR to digitize, preserve and extend access to *Technology and Culture*.

<http://www.jstor.org>

Presidential Address

THE RISE AND FALL OF THE APPROPRIATE TECHNOLOGY MOVEMENT IN THE UNITED STATES, 1965–1985

CARROLL PURSELL

Anchored in a period of social ferment and reform at one end, and in the Reagan years at the other, the two decades which saw the flourishing and the foundering of the Appropriate Technology movement in America encompassed also the end of the Vietnam War, a major energy crisis, and the first years of the environmental movement. The Appropriate Technology movement had its origins in perceived failings of the post–World War II technical aid efforts (by the United States and other northern hemispheric powers) in Third World countries but also quickly developed into a critique of American domestic technology. A welter of institutions were created: public and private; state, federal, and local; high-tech and low; aimed at underdevelopment overseas and overdevelopment at home. By the mid-1980s, however, most of these institutions had either disappeared or lost their momentum. The technologies themselves—solar energy, the generation of electricity by windmills, the utilization of abandoned dams for low-head hydroelectric generation, the development of methane gas and gasahol for fuel, a reemphasis on bicycles and mass transit, recycling and the use of natural materials, composting and sustainable (often organic) agriculture—survive, but without an ideological context which could give them political meaning.¹

DR. PURSELL is director of the Program in History of Technology and Science at Case Western Reserve University. He delivered this presidential address at the Society for the History of Technology meeting in Uppsala, Sweden, on August 19, 1992.

¹For some recent expressions of a renewed interest in classic appropriate technologies, see “Neglected Agency May Get Vital Role in Energy Policy,” *New York Times*, November 23, 1992; “A New Era for Windmill Power,” *New York Times*, September 8, 1992; “Energy Efficiency—the Only Way Out,” *Science* 256 (June 12, 1992): 1515; “3 Utilities in California Plan Desert Solar Energy Project,” *New York Times*, August 29, 1992.

© 1993 by the Society for the History of Technology. All rights reserved.
0040-165X/93/3403-0006\$01.00

To explain the rise of Appropriate Technology, one must take into account the convergence of a broad countercultural movement, a reassertion of doubts about the role of technology in American life, and the burgeoning environmental movement. This rich nexus was easily labeled “antitechnology” but, in fact, embodied a critique of certain technologies and certain definitions of the word, rather than a rejection of technology as such. The decline of the movement can be attributed to a combination of political and cultural factors. On the one hand, despite initiatives at the state level and by President Jimmy Carter, there was a lack of political commitment to changing the economic subsidies (including federally funded research and development budgets) that underwrote nuclear power, for example, but not the direct conversion of sunlight into electricity. Culturally, the campaign of the 1980s to “remasculinize” America after its defeat in Vietnam was profoundly antithetical to a movement that believed “Small Is Beautiful” and advocated “Soft Energy Paths,” to cite the titles of two of the most influential books in the literature of Appropriate Technology.² It is difficult to imagine Rambo deliberately choosing to ride a bicycle, or recycle his cartridges, simply because such practices would be gentle on the earth.

The debate over Appropriate Technology was rich in cultural meaning and ideological intent, as well as being a material and economic challenge to existing social interests. These interests were committed to a certain kind and understanding of technology which operated as a hegemonic culture, and to that privileged position the oppositional culture of Appropriate Technology mounted a profound challenge. Since technological change can be understood in terms of not only social forces but also of cultural meanings, it pays to look especially at the contested definitions of words. In so doing one finds often enough that Appropriate Technology was represented as more feminine than the hegemonic technology and therefore seen by some as a threat to accepted notions of masculinity. The eclipse of Appropriate Technology in the 1980s became an important part of the so-called remasculinization of America.

* * *

Post–World War II American aid programs can conveniently be dated from President Harry S Truman’s Point Four program, laid out in a speech on June 24, 1949. After warning that the “grinding

²I take the phrase from Susan Jeffords, *The Remasculinization of America: Gender and the Vietnam War* (Bloomington, Ind., 1989). In doing so I do not mean to suggest that masculinity is a single and immutable concept.

poverty” of the underdeveloped world might cause its populations to “turn to false doctrines which hold that the way of progress lies through tyranny,” he called for the United States to provide the “technical assistance [that] is necessary to lay the groundwork for productive investment.” There would be two parts to this assistance: first, what he called “the technical, scientific, and managerial knowledge necessary to economic development,” and second, “production goods—machinery and equipment—and financial assistance in the creation of productive enterprises.”³

To a significant degree, the American aid programs, and those of other developed nations, were captive to the notion that ideally all countries should follow the same pattern of industrialization, in both urban and rural settings, which had presumably been traced by the donor nations. Thus, large factories, a mechanized agriculture, the rapid exploitation of natural resources, and the making of an engineering infrastructure (especially large electrical power projects) were seen as critical. Often, as it turned out, such efforts ignored or misunderstood local environments, both natural and cultural. Dams that destroyed fisheries, dual economies that privileged local elites, and machinery that lay idle because of a lack of fuel or maintenance eventually led to the realization that many technologies that might be useful in donor countries might be worse than useless in different places and circumstances.

In 1973 the British economist E. F. Schumacher published his widely influential book *Small Is Beautiful*, subtitled *Economics as If People Mattered*. In this book he developed his vision of what he called an “intermediate” technology, one which fit between the primitive and poverty-reinforcing tools of much of the southern hemisphere and those large, powerful technological systems of the northern. Addressing a Unesco Conference on the Application of Science and Technology to the Development of Latin America, he defined the goal as creating workplaces that were located where people live, that would be cheap enough for common use, and that used relatively simple techniques and local materials to make things for local use.⁴ The intermediate technologies that met these criteria could be considered “appropriate” for that time and place.

Even before the appearance of Schumacher’s book, some private groups in the United States had been formed to address the problem. In 1959 Volunteers in Technical Assistance (VITA), a body of

³“Truman’s Point Four Program, June 24, 1949,” in *Documents of American History*, ed. Henry Steele Commager, 7th ed. (New York, 1963), pp. 558–59.

⁴E. F. Schumacher, *Small Is Beautiful: Economics as If People Mattered* (New York, 1973), p. 165.

scientists and engineers, organized to provide the technical assistance needed to help “enable low-income communities to use locally available and appropriate resources to meet their own needs for economic and social development.”⁵ A similar group, Volunteers in Asia, concentrated on appropriate development on that continent.

Almost immediately, however, the terms intermediate, alternative, and appropriate, often used interchangeably, proved to be almost infinitely malleable in meaning: intermediate between what, an alternative to what, appropriate to what? Referring to what it called “an illusion of consensus” around the term “alternative,” the Volunteers in Asia quoted one fellow worker as believing that “the meaning becomes established by convention within the community that uses it . . . the term ‘alternative technology’ has acquired an illicit content narrower than a strict interpretation would call for . . . which seems to be conditioned by the connotations of the word ‘alternative’ in the counter-culture of the West.”⁶

In the 1960s and 1970s new groups were springing up which advocated the application of a broader, and culturally challenging, understanding of appropriate technology to American society as well. Believing that the overdevelopment of the United States was as destructive of social and natural health as was underdevelopment in much of the rest of the world, such groups as the New Alchemy Institute in Massachusetts and the Farallons Institute in California advocated what the latter called “self-reliance, local autonomy, and respect for Nature. We demonstrate land use and living patterns that improve the quality of life by reducing energy consumption and dependence on fossil fuels. We design self-sustaining living patterns that increase our awareness of the balance between the realities of Nature and the needs of Man.”⁷ Appropriate technologies they defined as those “that are: 1) cheap enough to be accessible to nearly everyone, 2) simple enough to be easily maintained and repaired, 3) suitable for small-scale application, 4) compatible with man’s needs for creativity, and 5) self-educative in environmental awareness.”⁸

Private initiatives were soon followed by efforts of government, at all levels, to help develop appropriate technologies. Sim Van der Ryn, the architect who was president of the Farallons Institute in 1974, was appointed state architect by Governor Jerry Brown of California, and in 1976 his agency became the home of the new Office of Appropriate

⁵Angela Sinclair, *A Guide to Appropriate Technology Institutions* (London, 1984), p. 101.

⁶Ken Darrow and Rick Pam, *Appropriate Technology Sourcebook* (Stanford, Calif., 1976), p. 14.

⁷*The Farallons Institute* (Point Reyes, Calif., 1974), p. 3.

⁸*Ibid.*, p. 5.

Technology (OAT), also established by Brown. The OAT was housed in the Gregory Bateson Building, a state office structure designed by Van der Ryn and called “the most energy-efficient office building in the nation.”⁹ At the federal level, President Carter, in response to the 1973–74 oil embargo, initiated several energy-conservation programs which became associated with the Community Action Agencies, which, in turn, in 1976, became the core around which a National Center for Appropriate Technology (NCAT) was established.

Neither of these governmental initiatives survived the arrival of Republican administrations in Sacramento and Washington. In California the Office of Appropriate Technology was abolished by Governor George Deukmejian when he replaced Brown in 1982, and in 1981 the newly elected President Ronald Reagan terminated the federal Community Services Administration, leaving NCAT without institutional or financial support.¹⁰ In 1982, during repairs to the roof of the west wing of the White House, solar panels installed there by President Carter in 1979 were taken off, stored for a decade, then disposed of to a college in Maine.¹¹ It was a symptomatic, but not a unique, rolling back of the progress Appropriate Technology had made over the past decades.

In part this eclipse of the Appropriate Technology movement was attributable to its political failure to bring sufficient power to bear against entrenched advocates of the dominant American technologies of agribusiness, large private utilities, multinational construction and manufacturing firms, and the military-industrial complex, all of which had a vested interest in perpetuating and elaborating the large technological systems already in place. In part, however, it was also an example of the triumph of hegemonic culture over deliberate subversion by a truly oppositional culture. Indeed, those institutions showed a remarkable ability to expropriate emerging technologies for their own benefit. *Science* magazine charged, for example, that “despite the diffuse nature of the resource,” the federal “research program has emphasized large central stations to produce solar electricity in some distant future.” It quoted one critic as claiming that this was “creating solar technologies in the image of nuclear power.”¹²

⁹*Office of Appropriate Technology*, brochure issued by OAT (n.d.).

¹⁰“An Introduction and a History,” leaflet produced by the National Center for Appropriate Technology (n.p., n.d.).

¹¹Letter from Rex W. Scouten, White House curator, to author, July 20, 1992; “College Uses Panels Discarded by White House,” *Chronicle of Higher Education* 38 (July 1, 1992): A5.

¹²“Solar Energy Research: Making Solar after the Nuclear Model,” *Science* 197 (July 15, 1977): 241.

In 1976 the Boeing Aerospace Company beat out both Rockwell and Grumman to receive a \$970,000 research grant from the National Aeronautics and Space Administration and the Energy Research and Development Administration to study the feasibility of orbiting solar “power stations.”¹³

The meanings of words are frequently contested, and the discourse over the “true” definition of “technology” is as old as the word itself. Some have attempted to narrow its meaning, others have taken a more expansive view of the matter. Those who were eager to broaden the usage of the word tried to expand it in two directions: first, to disconnect it from the narrow and privileged discourse of engineering, and, second, to reach beyond recognizable tools and devices to include larger social systems.

For example, the 1976 publication *Radical Technology* included an essay entitled “Inner Technologies” which, after asserting that “the present technological paradigm is clearly in need of replacement,” warned that “it is unlikely that a truly holistic-ecological ethic can be built into technology if it is not already built into us as well.”¹⁴ To give a more recent example, the *New York Times* reported in 1992 that the Sacramento [California] Municipal Utility District (SMUD) was giving away shade trees to its customers. For every four cents of the cost of these trees, air conditioners would need one kilowatt hour less of electricity. Since generation costs were much higher than four cents per kilowatt hour, the program was billed as a “hard-headed, cost-effective” part of SMUD’s efficiency program, not the dreams of “a bunch of do-gooders, greenies.” Whether trees and “inner technologies” deserve to be considered as a part of technology is clearly a contested issue. Significantly, the general manager of SMUD in 1992 had not come up through industry ranks but had been, in the 1970s, head of an energy project for the Ford Foundation.¹⁵

The engineer and social commentator Samuel C. Florman, on the other hand, asserts that “to the engineer in the United States, the debate about whether technologies should in principle be large or small, hard or soft, high or low, is almost incomprehensible” since “engineering solutions have been inherent in the very scheme of things” rather than “arbitrarily decided.” Indeed, he believes “the technological issue is found to be a diversion, not at the heart of the

¹³“U.S. Seeks Way to Plug in to Sun,” *Los Angeles Times*, December 10, 1976.

¹⁴Peter Russell, “Inner Technologies,” in *Radical Technology*, ed. Geoffrey Boyle and Peter Harper (New York, 1976), p. 234.

¹⁵“An Energy Prophet Who Guessed Right,” *New York Times*, September 27, 1992.

matter.”¹⁶ By his definition, technology stands outside the social, political, and cultural struggle over what sort of country America should be, and what sort of lives its citizens should live. Appropriate Technology was, therefore, at the “heart,” not a technology at all. Our continuing failure to find one single, satisfactory definition for technology is directly tied to the fact that the stakes are high. In attempting to redefine technology, advocates of Appropriate Technology were directly challenging the power of those who shaped the hegemonic notion of that subject.

Another critical aspect of Appropriate Technology was that it was perceived as less manly, more feminine, than the nation’s dominant technological culture. I cannot make the case as completely as I would like on this occasion, but perhaps a few examples will suffice to suggest the nature of my argument. The persistent and central claim of Appropriate Technology, that it worked in gentle partnership with nature and fostered intimate personal relationships, linked it to the powerful cultural identification of nature and the personal with the feminine. A study of farmers in Wisconsin who were dedicated to the practice of what they called “sustainable agriculture” revealed that an overwhelming number of them did so in the name of family farms, of domestic rather than market values. As the investigator explained it, “They believe the principles of sustainable agriculture that could help preserve family farming (the reliance on small-scale, labor-intensive production using nonsynthetic chemicals, for example) are inseparably related to values that sustain farm families. These values include the integration of work life and family life, and environmental conservation.”¹⁷

Schumacher himself had labeled supporters of the conventional viewpoint “the people of the forward stampede,” and those who advocated appropriate technology, the “home-comers.” The operator of a low-head hydroelectric plant, quoted by John McPhee in 1981, insisted that “every machine is an individual. . . . A turbine is a symphony of noise. You listen. You know if something is missing. Being able to listen to a waterwheel is something that is not in the books.”¹⁸ Comments like this reveal attitudes far from the rhetoric of conquest and domination, rationality and control, that are often associated with masculine constructions of technology. In 1952 when the newly established Society of Women Engineers bestowed its first

¹⁶Samuel C. Florman, *Blaming Technology: The Irrational Search for Scapegoats* (New York, 1981), pp. 82–83, 88.

¹⁷Michael A. Gordon, “Oral Documentation and the Sustainable Agriculture Movement in Wisconsin,” *Public Historian* 11 (Fall 1989): 94.

¹⁸John McPhee, “Minihydro,” *New Yorker* 57 (February 23, 1981): 49.

Achievement Award on Dr. Maria Telkes, it reported that “since 1945 she has devoted herself chiefly to further research in the field of solar energy,” a field, according to her citation, “which has not been developed nearly as fast as, for instance, nuclear energy. She has been known to remark wistfully, ‘You see, sunshine isn’t lethal.’”¹⁹

Critics of Appropriate Technology often linked it to notions powerfully associated, in our culture, with the feminine. The Canadian architect Witold Rybczynski charged advocates with appealing to the “emotions” rather than to “reason,” and Florman accused them of “passive” resistance and wanting to “withdraw” from the prevailing culture. Their ideas, he warned, conjured up “Oriental attitudes,” a powerful image of otherness.²⁰

Concepts of masculinity and femininity, of course, like those of technology itself, are socially constructed and are being constantly reproduced and modified. None are unchanging or universally agreed on. Indeed, the culture of Appropriate Technology, as it was expressed from the mid-1960s to the mid-1980s, was more than a little reminiscent of two constructions of masculinity which were widely adhered to in the United States at the beginning of the 19th century: that attached to the republican gentleman, with its ideal of proportion and self-restraint, discipline of self and generosity toward others, and that associated with the independent producer, drawing pride of manliness from work, skill, the ownership of tools, self-reliance, and technical competence. Both were eclipsed as the 19th century wore on by the manly figure of the self-made, acquisitive entrepreneur, but neither disappeared completely. During the 1980s, however, it was easy for the dominant culture of American masculinity, which still drew heavily on the 19th-century entrepreneurial style, to see Appropriate Technology as a part of the experience of feminization that was read out of a recently resurgent civil rights movement, a growing women’s movement, a new environmentalism, and, most of all, a humiliating military defeat in Vietnam.

Reagan and Rambo were the perfect representatives of a masculine backlash against all of these, including what could be characterized by them as a cowardly and self-indulgent refusal to embrace technological vanguardism as the finest expression of national virility. It is significant that Rybczynski, in his book on Appropriate Technology, dismissively titled *Paper Heroes*, links the German-born Schumacher

¹⁹Society of Women Engineers, *Achievement Award, 1952–1974* (n.p., n.d.).

²⁰Witold Rybczynski, *Paper Heroes. Appropriate Technology: Panacea or Pipe Dream?* (New York, 1991), p. 13; Florman, pp. 81, 93.

with the *Jugendkultur* which flourished in the defeated Germany between the wars.²¹

The questions raised by the Appropriate Technology movement, and by its critics, are still very much with us. Our responsibility for aid to development extends now to the states of eastern Europe and the republics of the former Soviet Union as well as to the southern hemisphere. The environment is in even more danger from destructive technologies, and the geopolitics of oil still claim lives and treasure. The question of which technologies will be developed in the United States in the future, and which exported to newly developing and redeveloping nations, is a matter partly of technical feasibility, is very much an issue of social and political advantage, but is also, in ways that we do not well understand, the result of deeply held cultural perceptions.

²¹Rybczynski, p. 16.