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# THE SOFT, CUTTING EDGE OF ENVIRONMENTALISM: WHY AND HOW THE APPROPRIATE TECHNOLOGY NOTION IS CHANGING THE MOVEMENT\*

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## INTRODUCTION

By using the imagery of "soft, cutting edge" I do not wish at all to imply that environmentalism is getting "soft," i.e., weakening. Rather, I mean that the emerging, growing, leading edge of environmental thinking and action is the notion that environmental *and other* important problems have their source in "hard" technology systems and their solution in turning to "soft" or synonymously "appropriate" technology. (Hereafter I use only the term "soft" technology and its "hard" technology counterpart.) The proponents of the soft technology viewpoint would argue that their position represents a strengthening of environmentalism, not its weakening.

I shall defer a systematic definition of soft technology until a later section of this paper. For now the general meaning is conveyed sufficiently by examples of two kinds of energy systems. The existing hard energy systems are based mainly on nonrenewable fuels (oil, natural gas, coal, uranium) and involve large-scale, complex, centralized social organization and hardware. In contrast, soft energy systems are based on renewable resources (the sun and its derivatives) and involve smaller-scale, simpler, less centralized social organization and hardware. The key examples are nuclear energy and the various forms of dispersed solar collection and conversion. Conflicts surrounding these types of energy systems are important, but as we shall see, the soft technology notion encompasses much more than energy.

In this paper I describe where environmentalism has been and where it is now, but primarily I will speculate on where I see it heading. I will trace two relatively clear stages in environmentalism to date, namely what I call "enthusiasm" and "realism," and sketch a

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third, emerging one that I call the "softening" of environmentalism. The stages are convenient organizing and labeling devices, but of course real-world phenomena are not so neat and tend to blend, blur, and overlap. Vestiges of the initial enthusiasm have persisted to the present (and in fact are quite visible around the soft technology notion), and certain elements of the "softening" theme have existed for some time. Realism, then, represents what is currently the dominant mode in environmentalism. The focus here will be on the way the soft technology notion is influencing and promising to change this dominant mode and the reasons for this pressure for change.

My sketch of the enthusiasm and realism stages will be brief and will focus on those characteristics of environmentalism important to understanding what is happening at the soft edge. These earlier stages, at any rate, have been discussed in some detail in earlier papers—where the terminology is slightly different but the notions are substantially the same.<sup>1</sup> The discussion of the softening stage will describe the origins and nature of the soft technology notion and then focus on its influence on and relationship to environmentalism, especially through energy issues. A somewhat fuller account of the soft technology notion and movement is also available in a separate paper,<sup>2</sup> as is a broader account of the factors involved in the pressure for change in environmentalism.<sup>3</sup>

#### ENTHUSIASM

The environmental movement has deep roots—intellectually, ideologically, and in terms of both voluntary and institutional organizations. These roots and their connection to contemporary manifestations of the movement have been sketched in an instructive way by Fleming.<sup>4</sup> It is no overstatement that practically none of the contemporary environmental concerns is new, including the general notion of soft technology. Yet it is clear that the character and magnitude of mobilized concern for the environment became dramatically and publicly visible in the late 1960s and culminated in and around Earth Day 1970.

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1. Morrison, *The Environmental Movement: Conflict Dynamics*, 2 J. VOLUNTARY ACT. RESEARCH 74 (1973); Morrison, Hornback & Warner, *The Environmental Movement: Some Preliminary Observations and Predictions*, in SOCIAL BEHAVIOUR, NATURAL RESOURCES AND THE ENVIRONMENT 259 (W. Burch ed. 1972).

2. D. Morrison, *Energy, Appropriate Technology, and International Interdependence* (Aug. 1978) (paper presented at the Annual Meeting of the Society for the Study of Social Problems, San Francisco), reprinted in ENERGY, ENVIRONMENT, AND BEHAVIOR (C. Wolf & C. Unseld eds., in press).

3. Morrison, *Growth, Environment, Equity and Scarcity*, 57 SOC. SCI. Q. 292 (1976).

4. Fleming, *Roots of the New Conservation Movement*, 6 PERSPECTIVES AM. HIST. 7 (1972).

Grim accounts of air, water, and land pollution, overpopulation, and of an overstressed ecosystem were painted and popularized by the leaders of the movement. These accounts took both a verbal and a pictorial form. They were repeated in the media and in a great proliferation of movement-generated documents. All of this activity, together with the catalytic impact of the Santa Barbara oil spill of 1969, generated widespread belief by the general public in the seriousness and pervasiveness of environmental problems. It also generated in a smaller part of the public a strong sense of urgency, excitement, and fervor—in short enthusiasm, including much youthful enthusiasm and an associated burst of mobilization—to save the environment.

The older, established conservation groups were a central source of ideas, leaders, organizational activity, and resources for the new mobilization to protect the environment. They were joined by many new members and by many new voluntary organizations, the latter particularly at the local, state, and regional levels. Both old and new groups also were supported in less concrete but no less important ways by a public newly sensitive to environmental problems.

It is useful, then, to distinguish between the mobilized, organized “core” of environmentalism and the layers or “orbits” of unorganized environmental concern that can be viewed as successively less committed to environmental reforms as we move from the core.<sup>5</sup> Moreover, at the “core of the core” was a “power-oriented” segment of the movement.

I do not wish to imply by the notion of “power-orientation” that a segment of the movement was “power hungry”—i.e., interested in dominating the movement and/or society. Rather, I want to convey the idea that many older organizations, and some of the newer, larger organizations were explicitly committed to influencing *political* decisions to bring about concrete environmental reforms. Their aim was to institute laws and regulations and to create public agencies with the ability to impose strong, formal sanctions on the nonconforming—i.e., to achieve environmental reforms through coercion of the parties and processes causing environmental degradation.

Power was, of course, not the exclusive province of the types of groups outlined above, nor were these groups exclusively dedicated to a power-orientation. Indeed, the notion of “orientation” is meant to describe a dominant tendency, not an exclusive direction. But such power-orientation usefully can be contrasted to the “participa-

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5. See Hornback & Morrison, *The Role of Public Opinion in Social Movement Evolution* (Aug. 1975) (paper presented at the Annual Meeting of the American Socio-political Association, San Francisco).

tion-orientation" that was the most visible aspect of environmental concern in this period. Thus, the participation-orientation described below characterized most of the newer organizations and, in particular, most of the public beyond these.

In the pervasive, heady tenor of enthusiasm that surrounded Earth Day there was a tendency to assume that environmental reforms would come about through the efforts of individuals, families, firms, and communities making appropriate changes on the basis of their increased awareness of the way their actions produced environmental problems. Or at least it was obvious to many that awareness of the need to protect the environment would cause narrow self-interests or simply bad habits to be put aside in a spirit of good will in order to achieve the necessary laws and behavior.

The justification for such an assumption seemed to many of the newer of the core environmentalists, and indeed to many politicians, to be implied in the wide public concern for the environment. Thus, along with an emphasis on the necessity of political *power* at the heart of the core, much of the newer environmental concern around Earth Day consisted of a belief that reform would come from more or less voluntary, gently coerced *participation* in actions that would result in changes which would solve major environmental problems.

"Participation orientation" was, of course, mostly unrealistic, but it was nevertheless a very useful and important part of public opinion that allowed "realpolitics" to operate in the power-oriented part of the core. This segment of environmentalism was deeply involved in concerted, concrete efforts to obtain the legal and associated institutional frameworks to make sure environmental reforms would not depend on voluntary behavior. Their efforts, made in the context of wide public concern, were uniquely successful. But their successes insured that the widespread public interest in protecting the environment soon would become a much less visible feature of environmental concern than the conflict that would surround the implementation of specific reforms. Thus, what was most publicly apparent (i.e., evident in the media) in environmentalism in the period following Earth Day was a change from a mood of participation and consensus to one of power and conflict. But in an important sense these visible features and changes masked much that was of crucial importance, even if less than obvious in media portrayals.

### REALISM

One result of the declining environmental enthusiasm that rapidly set in for the voluntary movement organizations after Earth Day was

the need to adjust to a slowed membership growth, a steady state, or, in some instances, the reversal of previous growth trends. There was much shaking out of the voluntary groups. In particular, groups organized independently at local and state levels and those with most of their support base in the youngest part of the population (e.g., students) tended to falter, to decline in numbers, and in some cases disappear. The larger, older, nationally based groups and a very few of the newer national groups (e.g., Friends of the Earth, Environmental Action) managed to consolidate gains and substantially to maintain memberships, even though their rapid growth of membership around Earth Day leveled visibly.<sup>6</sup> A few such groups (e.g., Zero Population Growth) experienced dramatic drops in chapters and in membership and then, apparently, achieved a somewhat fragile stability at a much more modest level.<sup>7</sup>

As Mitchell and Davies show, however, the major voluntary groups have as a whole remained healthy, both in terms of membership numbers and in terms of resources.<sup>8</sup> Undoubtedly this is due largely to the fact that they have been able to translate the membership and monetary resources and the broad institutional and legal gains of the Earth Day period into concrete victories in the subsequent conflicts and, beyond this, to insure that these successes are not diluted in lax enforcement actions. But Mitchell's research also shows that public belief in the severity of environmental problems and public support for environmental protection have held up remarkably well despite the visible decline of the enthusiasm of the earlier period, the presence of environmental conflicts, and the present pervasive awareness of the necessary tradeoffs.<sup>9</sup> The apparent "fadishness" and public naïvete of the Earth Day period well might have predicted a rapid, general retreat from hard-nosed environmental reform, but now it is clear that all core environmentalists and much of the public are prepared to support a power-orientation for environmentalism.

This does not imply, of course, that environmental reforms have been to the liking of everyone. If this were the case we would expect

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6. Mitchell & Davies, *The United States Environmental Movement and Its Political Context: An Overview* (Jan 1978) (paper presented at the Conference on Environmental Awareness and Political Change, Berlin).

7. See Barnett, *Zero Population Growth, Inc.*, 21 *BIOSCIENCE* 759 (1971); Barnett, *Zero Population Growth, Inc.: A Second Study*, 6 *J. BIOSOCIAL SCI.* 1 (1974); Tillock & Morrison, *Group Size and Contributions to Collective Action: An Examination of Mancur Olson's Theory Using Data from Zero Population Growth, Inc.*, in 2 *RESEARCH IN SOCIAL MOVEMENTS, CONFLICTS & CHANGE* 131 (L. Kriesberg ed. 1979).

8. Mitchell & Davies, *supra* note 6.

9. Mitchell, *The Public Speaks Again: A New Environmental Survey*, 60 *RESOURCES* 1 (1978); Mitchell, *Silent Spring/Solid Majorities*, 2 *PUBLIC OPINION* 16 (Aug.-Sept. 1979).

complete consensus on environmental issues. This is not the case. A substantial consensus on the importance of continuing environmental reform persists, but environmental conflicts are now the most visible feature of environmentalism.

The most general feature of the rapid transition from the environmental enthusiasm that bracketed Earth Day by about a year has been the increasing recognition, especially by the general public and by politicians but also by many newer elements of core environmentalism, that the reality of environmental reforms involves unavoidable tradeoffs. The tradeoffs of environmental features such as clean air, water, and wilderness for economic features such as efficiency, independence of action, profits, jobs, and cheap goods and services were apparent to the power core of environmentalism from the beginning, as was the potential for corresponding conflict. The power core was fully aware that for much of the general public and especially for specific groups, environmental reforms would involve concrete economic and other costs that often would not be borne voluntarily. But in substantial measure these costs either were not anticipated or were underestimated in the "appliance and motherhood" definition of environmental concern that surrounded Earth Day. This was the case, at least, for a large segment of the public, and for politicians who supported or quietly acquiesced in a wide variety of legislation (the National Environmental Protection Act being, of course, the prime example).

The general enthusiasm, idealism, and even euphoria over the environment that peaked around Earth Day facilitated the rapid development of the legislative and regulatory means for implementing and enforcing environmental reforms. Implementation of these reforms rapidly changed this mood to one of realism as a stream of conflicts arose over the substance, costs, methods, and rates of environmental protection.<sup>10</sup>

My purpose here is not to discuss the substance and process of these environmental conflicts in detail. Rather, I will focus on a closely interrelated set of several broad problem themes that are regularly and vociferously debated in both specific and general environmental conflicts. Each of the following problem themes could be discussed in the context of environmental issues connected with a variety of environmental topics—e.g., water, air, land, and so on. But the debate on all these problems in the context of the energy problem created by the 1973 oil embargo and the subsequent energy

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10. See Morrison, *The Environmental Movement: Conflict Dynamics*, 2 J. VOLUNTARY ACT. RESEARCH 74 (1973).

price rise has been responsible for the increased receptivity of environmentalists to soft technology notions. In the following, then, I focus on the way the energy situation has exacerbated conflict around these themes and also suggest, as a prolegomenon to the next section, the sense in which the soft technology notion helps environmentalism address these issues.

### ENERGY EXACERBATIONS OF PROBLEM THEMES IN ENVIRONMENTAL CONFLICTS

#### *Efficacy*

The 1973 oil embargo and its sequel of rising oil prices brought sharp attention to several persistent and uncomfortable environmental issues connected with the general issue of whether environmental reforms actually have had their intended impacts. Especially important in the case of conflicts over energy has been the question of the long-term and global impacts of United States environmental policies.

Restrictions on offshore drilling, on the Alaskan and other pipelines, on coal burning, and on auto emissions (which in the early 1970s involved technologies that reduced mileage) in the name of environmental protection were factors environmental adversaries could point to as related to the increased oil imports that in turn increased vulnerability to the Organization of Petroleum Exporting Countries (O.P.E.C.). In the broad international perspective it was at least arguable that the overall risks of environmental danger from oil drilling, pipelines, and sea transport of petroleum were not decreased by United States policy, and indeed probably increased. The oil exporters and transporters had strong financial incentives to meet the high demands for petroleum and were (and are) largely able to operate outside the context of regulations promoted by environmentalists. The fact that high United States and other developed country demand increased petroleum prices also encouraged developing countries to exploit their indigenous supplies of petroleum and other conventional energy sources, again largely outside the environmental constraints operating in developed countries.

The domestic energy situation caused increased internal pressures for energy development and caused some environmentalists to ease or reverse their previous stands on coal in the belief that cleaner coal-burning techniques and cleaner-burning types of coal could replace petroleum and still conform to environmental standards for air quality. It was (and is) not clear, however, whether even with new regulations on strip mining such a change simply would not shift the



type and locale of environmental problems, rather than maintain or improve overall environmental quality (e.g., create land, water, and air degradation in the West—plus a host of severe environmental and social impacts in energy boom towns—instead of urban air pollution).

Nuclear energy tended to avoid some of the air and water pollution problems associated with fossil fuels but introduced new and greatly feared risks of radiation. Additionally, environmentalists feared the increased risk of ultimate, worldwide environmental destruction through nuclear warfare, since they reasoned that an increase in United States nuclear development would encourage proliferation of nuclear weapons technology and materials.

Thus, all of the “off the shelf” energy alternatives were problematic in domestic environmental terms, and some promised a net increase in environmental problems. Further, domestic environmental policies tended, in effect, to “export” environmental problems—i.e., to increase environmental problems in foreign settings, and ultimately throughout the world. These considerations raised crucial questions of whether the long-term and increasingly international scope of environmental problems could be addressed meaningfully by current environmental policies of piecemeal technological patch-up and regulation. Many environmentalists decided policies to reduce the externalities from nonrenewable energy resources, however necessary, were not the sufficient, programmatic basis for an ecologically sustainable global economy.

### *Equity and Humane Values*

Accusations that environmentalists are “elitist”<sup>11</sup> were well articulated prior to the energy crisis and were paralleled by a closely

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11. It is important to distinguish between three main bases or criteria employed in accusations of environmental elitism. The criterion of *compositional elitism* involves the accusation that the supporters of environmentalism have privileged socio-economic characteristics or situations. This criterion is usually used in close conjunction with the criterion of *ideological elitism*, which accuses environmental proposals of being more or less obviously intended to distribute benefits to environmentalists and/or costs to nonenvironmentalists, particularly to the less privileged. *Impact elitism* is the accusation that, whether intended or not, environmental reforms can be factually demonstrated to have distributed, or can be anticipated on the basis of objective, factual analysis to have a high probability of distributing, benefits to environmentalists and/or costs to others. The accusation is, of course, directed at impacts on the less privileged—i.e., environmental reforms are regressive. Impact elitism is, in my view, the bottom line. But the evidence for such impacts is on the whole much less clear than for ideological and especially for compositional elitism, criteria that are ultimately important only if what they imply to the accuser can be sustained at the level of concrete impact analysis. Implicitly in the discussion in this paper I have used the impact criterion. See Morrison, *Compositional, Ideological, and Impact Bases for Accusing Environmentalists (or others) of “Elitism”*: Some Notes on the Importance of Conceptual Disaggregation (Oct. 1979) (unpublished paper, Department of Sociology, Michigan State University).

related set of claims that environmental values were pro-nature and anti-human.<sup>12</sup> These claims and the conflicts over them also were exacerbated in the energy crisis. For example, some energy development-environmental issues connected with the damming of scenic rivers for hydropower, strip mining of wild lands, and offshore oil drilling involved claims that environmental resistance protected natural environments that, not incidentally, were the playgrounds of the affluent—most particularly the environmentalists—at the cost of the energy needs of the poor and, more broadly, at the cost of increased jobs for underdogs through increased economic growth via energy growth.<sup>13</sup> Clearly the most devastating impacts of the energy price increase fell on the poor, especially on the poor in developing countries.<sup>14</sup>

Environmentalists came under severe pressure to ease their call for standards that impeded energy development and that thus served to increase energy scarcity and energy price—a key example of Schnai-berg's "planned scarcity" general characterization of environmental

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sity). See Mitchell, *supra* note 9 for evidence which suggests that public support for environmentalism is not sharply differentiated among the social classes. Mitchell's data is relevant to the general question of compositional elitism, but the accusation of elitism on compositional grounds typically is more directed at what I have in this paper called the "core" environmentalists (i.e., leaders of and direct contributors to environmental organizations) whose privileged socio-economic characteristics and situations are clear. As I point out in the above paper, this does not necessarily imply ideological or impact elitism for core environmentalists—or others, since the leaders and main supporters of nearly all movements tend toward such compositional elitism. Mitchell's evidence on the wide *public* support for environmentalism and the lack of sharp class differentiation in this support would seem to suggest that the public as a whole does not consider environmental ideology or environmental impacts elitist.

12. R. NEUHAUS, IN DEFENSE OF PEOPLE: ECOLOGY AND THE SEDUCTION OF RADICALISM (1971); Sills, *The Environmental Movement and Its Critics*, 3 HUMAN ECOLOGY 1 (1975).

13. See Tucker, *Environmentalism and the Leisure Class*, HARPER'S, Dec. 1977, at 49. The same theme runs through the large number of "editorials" the Mobil Corporation has for several years been running in major newspapers and periodicals. The Mobil point of view pertains directly to all the problem themes discussed here and is well summarized in the last paragraph of a recent Mobil "editorial" expressing skepticism about "public interest" groups, including, unmistakably and prominently, environmentalists:

We welcome this new skepticism about the "public interest" label, and about who is really entitled to it. We think the media should be careful about granting it to small groups who are—on the record—anti-growth, anti-business, anti-energy, and dedicated to an elitist, big-government view of America. That's a very small, very special interest, a long way from the goals and ideas of the American people.

Mobil Corporation, *Who's the Public in "Public Interest" Politics?*, N.Y. Times, Nov. 1, 1979, § A, at 23, col. 4.

14. Morrison, *Equity Impacts of Some Major Energy Alternatives*, in ENERGY POLICY IN THE UNITED STATES: SOCIAL AND BEHAVIORAL DIMENSIONS 164 (S. Warkov ed. 1978). See also Morrison, *Growth, Environment, Equity & Scarcity*, 57 SOC. SCI. Q. 292 (1976).

reforms.<sup>15</sup> Environmentalists argued that the slackening of environmental standards would not only increase environmental problems from energy residuals but would speed the depletion of a fundamentally important nonrenewable resource, a scenario that the poor would not survive and which would soon make poor those presently affluent. Thus it was reasoned that in the short run cheap, nonrenewable resources would be the basis for even more serious regressive impacts in the long run than if planned scarcity obtained at present. Still, a posture that had the result of increasing energy prices was vulnerable to the accusations of elitism and of a lack of concern with social equity and humane values that have long been a theme of environmental critics.

The energy situation also made clear the broader outlines of international equity issues connected with natural resources, especially the fact that the United States and other developed countries were using and would in fact rapidly exhaust the lion's share of the world's petroleum resources. Yet, in the face of this situation a leading environmentalist seriously proposed the necessity for a "lifeboat" strategy to reduce the population pressure of developing countries on world resources.<sup>16</sup> His proposal was controversial both inside and outside environmental circles, but on the whole it did little to promote a generous interpretation of environmentalists by humanists, who, of course, favor an opposite strategy of reducing profligate resource use by the affluent, as well as redistribution and development aid.<sup>17</sup>

The controversy surrounding these issues led many environmentalists to become more sensitive and to blend their concern for environmental quality with equitable and humane considerations, including a concern for the basic human needs of the international poor. The soft technology proposal provided a framework that specifically incorporated these value concerns in a positive program for implementation around the notion of sustainable—and thus at a fundamental level ecologically sound—productive systems.

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15. Schnaiberg, *Social Synthesis of the Societal-Environmental Dialectic: The Role of Distributional Impacts*, 56 SOC. SCI. Q. 5 (1975). See also SCHNAIBERG, *THE ENVIRONMENT: FROM SURPLUS TO SCARCITY* (1980). In this book Schnaiberg analyzes the relationship of the environmental movement and the appropriate technology movement in a way largely compatible with the present paper.

16. Hardin, *Lifeboat Ethics: The Case Against Helping the Poor*, 8 PSYCH. TODAY 38 (1974).

17. See Commoner, *How Poverty Breeds Population (And Not the Other Way Around)*, RAMPARTS, Aug.-Sept. 1975, at 21, 22; LIFEBOAT ETHICS: THE MORAL DILEMMAS OF WORLD HUNGER (G. Lucas, Jr. & T. Ogletree eds. 1976).

### *Economic Growth*

Environmentalists often have been accused of promoting policies that constrain economic growth and its assumed corollaries of more jobs and improved material welfare for all.<sup>18</sup> The oil embargo and subsequent energy price increase brought an immediate and visible stutter and subsequent downturn in the economic growth trajectory and, for some, promised more to come. To many environmental adversaries it became obvious that economic growth and energy were well coupled, and that policies that constrained energy development or use—notably those made in the name of environmentalism—were unacceptable. Indeed, with the publication of *The Limits to Growth* in 1972<sup>19</sup> it became a widely accepted tenet of environmentalism that growth, especially growth based on nonrenewable resources, could not long continue.

Again, a positive, programmatic proposal for an alternative energy source based on a renewable resource and on productive processes that would simultaneously reduce pollution and increase employment (especially at the lower skill levels), and that argued that economic growth and energy growth could be de-coupled—in short the soft technology proposal—was welcomed by many environmentalists grown both sensitive to and weary of accusations of the negative, anti-growth, even anti-progress, tenor of their movement.

### *International Development*

The sense in which the energy crisis aggravated long-festering conflicts between environmental and Third World development concerns has been suggested above. Suffice it to say in addition that all the domestic accusations of inequity/inhumanity, inefficacy, and anti-growth had their international dimensions and, as a package, easily translated into claims that environmentalism was at best irrelevant and at worst antithetical to the basic problems of growing poverty and dependence<sup>20</sup> in developing countries.

Obviously, environmentalists were not prepared to embrace all these claims. But the international nature of the energy problem and

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18. B. FRIEDEN, *THE ENVIRONMENTAL PROTECTION HUSTLE* (1979); Rustin, *No Growth Has to Mean Less and Less*, N.Y. Times, May 2, 1976, § 6 (Magazine), at 13. See also Mobil Corporation, *Who's the Public in "Public Interest" Politics?*, N.Y. Times, Nov. 1, 1979, § A, at 23, col. 4.

19. D. L. MEADOWS & D. H. MEADOWS, *THE LIMITS TO GROWTH* (2d ed. 1974).

20. D. Morrison, *Energy, Appropriate Technology, and International Interdependence* (Aug. 1978) (paper presented at the Annual Meeting of the Society for the Study of Social Problems, San Francisco), reprinted in *ENERGY, ENVIRONMENT, AND BEHAVIOR* (C. Wolf & C. Unseld eds., in press).

the set of interrelated global issues it articulated forced environmentalists not only to think in terms of global environmental dangers of development but also to address the question of how the pressing need for development could be *reconciled* with global environmental quality.

The soft technology movement did not grow out of a specific concern with either environmental or energy issues. But as we shall see, it offered not only a critique of development in the Western mode, but a new conception of "development." This conception stresses the importance of simultaneous solution of energy and environmental problems in the developed *and* developing countries in the context of the major goal of solving problems of growing poverty in developing countries.

### THE SOFTENING OF ENVIRONMENTALISM

#### *The Origins and Nature of Soft Technology*

The debate over energy alternatives to reduce vulnerability to the O.P.E.C. developed immediately following the oil embargo of 1973. It generated conflicts between those favoring rapid development of all the potentially available conventional domestic sources (oil, natural gas, coal, nuclear) and those arguing against this policy on environmental grounds. Accusations of environmental inequity/inhumanity, opposition to growth, inefficacy, and a lack of concern for international economic development escalated. As discussed above, environmentalists could not dismiss this package of accusations entirely, nor could they be satisfied with an approach to energy problems which seemed to offer no alternatives to conventional energy development.

This situation clearly dictated that environmentalists would be receptive to an alternative to conventional energy development that was positive and programmatic, that incorporated environmental concerns, and that would meaningfully address the package of accusations discussed previously. Since the soft energy proposal that rapidly gained favor among environmentalists was incorporated in a much broader notion about the relationship of technology, resources, productive systems, and their human and environmental impacts, the endorsement of the soft *energy* approach by environmentalists meant additionally—and importantly—that environmentalists would simultaneously move toward receptivity to the broader, more generic content of the parent soft *technology* notion.

The thinking of E. F. Schumacher as reflected in his seminal book *Small Is Beautiful*, published around the time of the oil embargo,

provided the general framework for what he termed "intermediate" or "appropriate" technology, or what has also come to be termed "soft" technology.<sup>21</sup> It was through the Schumacher book that the soft technology notion became widely known in the developed countries, but his work on soft technology started much earlier, as did an international social movement around the soft technology notion.

The soft technology movement started to gain visibility in the late 1960s, the same period that saw the visible development of the environmental movement. Nearly the entire emphasis of soft technology at that time was on the problems of international economic development, especially in seeking an alternative to address the failure of technology transfer in the "hard technology" western mode to reduce poverty, particularly rural poverty, in developing countries.<sup>22</sup> While environmental problems were not the major focus of the original soft technology concern, technologies that pollute or degrade or deplete natural resources were clearly inappropriate. Ecosystem integrity was explicitly recognized as fundamentally important in the soft technology notion from its inception,<sup>23</sup> even though environmental problems, especially those of concern in developed countries, were not given priority among the problems facing developing countries.

Amory Lovins focused the basic thrust of the soft technology notion on the energy problem and emerged with an immensely influential proposal for a soft energy path in his *Foreign Affairs* article of late 1976—a transition from nonrenewable energy (especially away from nuclear) to renewable energy (especially dispersed solar).<sup>24</sup> Although Lovins seems reluctant to acknowledge that his notions stem from, endorse, and amplify the broader soft technology perspective, it is clear that both the appeal and the controversial nature of his proposal must be understood in the context of the broader soft technology notion.<sup>25</sup>

His central notion is that energy and environmental *and other* problems of developed and developing countries—including an excep-

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21. E. F. SCHUMACHER, *SMALL IS BEAUTIFUL* (1973). The term "soft" technology was used extensively in an important elaboration of Schumacher's basic notion by D. DICKSON, *THE POLITICS OF ALTERNATIVE TECHNOLOGY* (1975).

22. See R. K. VEPA, *APPROPRIATE TECHNOLOGY FOR A DECENTRALIZED ECONOMY* (1969).

23. See E. F. SCHUMACHER, *SMALL IS BEAUTIFUL* (1973).

24. Lovins, *Energy Strategy: The Road Not Taken?*, 55 *FOREIGN AFF.* 65 (1976). Energy efficiency and energy conservation are also integral, important parts of the soft energy path notion.

25. See A. B. LOVINS, *SOFT ENERGY PATHS: TOWARD A DURABLE PEACE* 11-12 (1977).

tionally broad array of economic, social, and political problems—have a common source in hard energy technology and a common solution in soft technology.<sup>26</sup> Since the publication of his provocative article and subsequent book<sup>27</sup> and the amplification of much the same argument by Commoner<sup>28</sup> and many others, environmental thinking has increasingly incorporated soft technology notions.

Soft technology, despite what may seem to be implied in the term, is not at all a narrow notion about technology *per se*. The soft technology notion is a broad political-economy critique and proposal for a fundamental revision of the total hard sociotechnical system. In contrast, environmentalism to date involves critiques of specific technologies and proposes piecemeal patch-up and regulation to achieve specific environmental outcomes, often in terms of pollution standards.

The soft technology critique of existing hard technology systems may be summarized<sup>29</sup> as follows: means and relations of production that are capital intensive, complex, large-scale, centralized, resource intensive, resource depleting, resource degrading, and resource exogenous have undesirable social impacts. The hard systems displace people, especially underdogs, from jobs, alienate the employed from their work and the unemployed from society, create overabundance for a few while depriving the masses of their basic needs or at least making them dependent on others, create social units that are vulnerable to external events, destroy the environment, and ultimately destroy the affluent lifestyles they create. They are, in short, inappropriate on the grounds of social equity, humane values, and ecological sustainability. Such technologies are characterized as “hard” because their impacts are defined by soft technology advocates as harsh, difficult, injurious, severe, and repellent.

On the other hand productive systems that involve light capital and are small in scale, decentralized, resource conserving, and re-

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26. For instance, I have identified over 70 claimed social impacts of soft energy in Lovins' work. D. Morrison, *Should We Follow the Soft or Hard Energy Path? Some Social Science Considerations*, in PROCEEDINGS OF A WORKSHOP ON THE SOCIAL DIMENSIONS OF ENERGY POLICY (J. Cameron ed. 1980).

27. See A. B. LOVINS, *SOFT ENERGY PATHS: TOWARD A DURABLE PEACE* 11-12 (1977).

28. B. COMMONER, *THE POVERTY OF POWER* (1976); Commoner, *The Solar Transition I*, *NEW YORKER*, April 23, 1979, at 53; Commoner, *The Solar Transition II*, *NEW YORKER*, April 30, 1979, at 46.

29. For details on the soft technology critique and proposal see DICKSON, *supra* note 21; SCHUMACHER, *supra* note 23; Commoner, *supra* note 28; Lovins, *supra* notes 24 & 25. See also C. NORMAN, *SOFT TECHNOLOGIES AND HARD CHOICES* (1978); L. WINNER, *AUTONOMOUS TECHNOLOGY* (1977); *APPROPRIATE TECHNOLOGY: PROBLEMS AND PROMISES* (N. Jequier ed. 1976); *APPROPRIATE VISIONS* (C. Dorf & Y. Hunter eds. 1978).

source indigenous are appropriate because they have desirable social and environmental impacts. They create meaningful work for all, supply basic needs for all, allow self-sufficiency, and create an ecologically sustainable, higher quality of life. Their social and environmental impacts are defined by their proponents as agreeable, pleasant, comfortable, and gentle—i.e., “soft.”

It is crucial to note that the *social welfare* impacts—directly and indirectly through environmental impacts—and especially those broadly associated with long-term, global social equity are the bottom line in the soft technology critique of hard technology and in the claims of the soft technology proposal. This is further emphasized in Table 1, which is reproduced from a previous analysis of mine.<sup>30</sup> It describes the above notions in somewhat greater detail and in more comparative perspective by showing the soft technology critique of hard technology, the soft technology proposal, and the hard technology critical reaction to the soft technology critique and proposal—the soft technology notion being far from uncontroversial, of course.<sup>31</sup>

### *The Environmental Movement—Soft Technology Movement Connection*

Environmentalism and especially the broad, international advocacy of soft technology have relatively clear, mostly separate identities as social movements. Yet these movements are increasingly related in ways that are generally complimentary, mutually amplifying, and specifically intersecting. Clearly, however, the relationship is somewhat asymmetric; most of the flow of influence goes from soft technology to environmentalism.

The most concrete manifestation of the intersection of the soft technology and environmental movements is seen in the strong, growing branch of the soft technology movement that emphasizes applications *in* the developed countries. This branch tends to focus on soft energy. But more generally this branch attempts to apply soft energy and other soft technology notions to achieve equity, and

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30. D. Morrison, Energy, Appropriate Technology, and International Interdependence (Aug. 1978) (paper presented at the Annual Meeting of the Society for the Study of Social Problems, San Francisco), reprinted in ENERGY, ENVIRONMENT, AND BEHAVIOR (C. Wolf & C. Unseld eds., in press).

31. See, e.g., Florman, *Small is Dubious*, HARPER'S, Aug. 1977, at 10; Nash, *Problems in Paradise*, 21 ENVIRONMENT 25 (July-Aug. 1979); SOFT VS. HARD ENERGY PATHS: 10 CRITICAL ESSAYS ON AMORY LOVINS' "ENERGY STRATEGY: THE ROAD NOT TAKEN?" (C. Yulish ed. 1977); Rybczynski, *After Appropriate Technology* (Feb. 1978) (paper presented at the Meetings of the American Association for the Advancement of Science).



TABLE 1

A COMPARISON OF CHARACTERISTICS AND CRITIQUES OF  
SOFT TECHNOLOGY (ST) AND HARD TECHNOLOGY (HT)

<i>The Soft Technology Characterization and Critique of Hard Technology</i>	<i>The Soft Technology Proposal</i>	<i>The Hard Technology Rationale for Itself and Its Reaction to the Soft Technology Proposal</i>
<p>1. Capital intensity of HT makes it unaffordable except by an economic elite.</p> <p>2. HT involves highly concentrated capital organized in economic monocultures controlled by and benefiting mainly an elite.</p> <p>3. Large-scale economic organization of HT brings human and environmental costs that completely offset productivity benefits.</p> <p>4. HT systems involve centralized, authoritarian decision-making in which ordinary people have no role, no control over their fate.</p> <p>5. Centralized innovation by experts creates an elite; "trickle down" of benefits tends not to reach the poor while culturally disruptive costs do.</p> <p>6. Automated, large-scale HT displaces people, especially underdogs, from jobs and is exploitive and de-humanizing for</p>	<p>1. Low cost, low capital, affordable technology.</p> <p>2. Distributed capital, small entrepreneurship, diversity.</p> <p>3. Technology that is small-scale, controllable, repairable, durable, reliable, safe, simple but sophisticated; small is beautiful.</p> <p>4. Decentralized, democratized decision making; production under the control of technology users and local communities.</p> <p>5. Local innovation, development, and "bottom out" diffusion of technologies related to basic needs guarantees compatibility with local cultures. No royalties, patents, or import/export curbs on technological soft or hardware.</p> <p>6. Employment intensive technology, meaningful jobs.</p>	<p>1. Modern HT is expensive but also efficient and productive ST is primitive, second-rate, inefficient, and unproductive.</p> <p>2. Concentrated capital and associated HT scale are economic imperatives of productive industry. ST brings cottage industry, craft economy, and associated low productivity, low incomes.</p> <p>3. Efficiency characteristics and productivity benefits of economies of large scale are well demonstrated; benefits clearly outweigh costs. ST is romantic, risky; small is pitiful. Small is not bountiful.</p> <p>4. Rational, scientific economic planning and management requires expert, centralized decision-making and control. ST is economic chaos.</p> <p>5. Rationally programmed R&amp;D by experts, backed by solid basic science, has demonstrated productive merits. ST is haphazard, "tinker-tech." Development inevitably involves change toward the image of modern, developed societies.</p> <p>6. HT is labor-saving. ST is backward, back-breaking.</p>

7. Specialization around HT separates, isolates, and alienates. The resulting "interdependence" is in fact hierarchical and adversarial dependence.
7. De-mythification of HT by reducing scale, complexity, and segmenting of work roles. Low and fluid division of labor; low stratification in work organization. Nonadversarial relations of production. Freedom, openness and self-fulfillment in work.
8. Work in HT society is for greeds, not needs—i.e., consumer "demands" artificially created to sustain "growth" in the economy and involving complex, fragile interdependencies.
8. Emphasis on local production or sustained provision of local basic needs. Emphasis on quality of life, not economic growth.
9. HT creates simultaneous consumer affluence for a few and high unemployment.
9. Full employment, moderate levels of living, minimal income differences.
10. HT wastes, depletes, and denigrates natural resources and creates dangerous environmental pollution. HT creates competition for increasingly scarce resources and the associated means for destruction via weaponry.
10. Sparing use of indigenous natural resources, especially nonrenewable ones, reduces the potential of conflicts over scarcities. Ecologically sound development that preserves environmental quality.
11. HT moves society toward large, highly centralized, urbanized communities that are crowded, interdependent, vulnerable; the countryside is depopulated.
11. Decentralized, small, self-sufficient, relatively autonomous communities where production and consumption are integrated around basic need provision through ST at the local level, thus reducing vulnerability to outside actors and increasing social resiliency.
7. Specialization in resource inputs to production, including the division of labor, is the foundation of efficiency and productivity. Workers organize to improve their situation. Conflicts are minimized through institutionalized labor-management relations. Nonspecialization around ST guarantees inefficiency and low productivity.
8. Only through demands for goods created in affluent, developed sectors will jobs be created and basic needs be satisfied in the developing, poorer sectors. Economic growth benefits all as the whole ladder rises. ST involves leveling at an acceptably low level.
9. Affluence is intrinsically good, and moreover provides the surplus to allow even the unemployed to have basic needs provided. Full employment at a subsistence level with ST has no intrinsic merit.
10. Rational management, development, and utilization of natural resources, including a continuing search for substitutes for scarce resources, brings sustained productivity. The "limited good" mentality of ST means economic underdevelopment and stagnation. Only *more* HT can preserve environmental quality, or security.
11. Concentrated populations have well-known advantages in increasing the levels of economic, social, and cultural amenities. The ST notion of community self-sufficiency is romantic; rural communities are inevitably backward, provincial, isolated and poor.

humanistic and quality of life goals in the satisfaction of a range of basic needs such as employment, food, shelter, transport, clothing, health care, child rearing, and education. These efforts range from newly institutionalized movement organizations (e.g., the National Center for Appropriate Technology; Ozark Institute; Institute for Local Self-Reliance; California Office of Appropriate Technology; Solar Energy Research Institute), to local, state, regional, and national voluntary groups (e.g., Long Island Appropriate Technology Group, Washington, D.C.; Friends of Appropriate Technology; Michigan Solar Energy Associate; Western Sun; National Solar Lobby), to individual efforts to achieve simplicity. Critically important in binding these efforts into a coherent, if uncoordinated, network are numerous newsletters, magazines, and other publications which invariably blend specific information on hardware and technological processes with messages emphasizing the broader social goals of soft technology.<sup>32</sup>

All of these manifestations of the domestic soft technology movement are well attuned to and in fact consider themselves part of the broader, international soft technology movement. The relationship of the domestic and the international movements, however, is an informal one of shared ideology and information, rather than one of formal links between the domestic organizations and those that operate in and/or mainly for the developing countries (e.g., the Appropriate Technology Development Association in India, Schumacher's original Intermediate Technology Development Group, Volunteers in Technical Assistance, Mt. Rainier, Maryland).<sup>33</sup> The major, most common difference between the domestic and international branches of the soft technology movement (in addition, of course, to their respective foci on applications in developed and developing countries) is the fact that the domestic version unflinchingly blends a much more explicit and central concern for environmental values with the concerns for equity, humanism, and quality of life that are found in all soft technology thinking.

The "new age politics" notion increasingly associated with the

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32. See, e.g., RAIN: J. APPROPRIATE TECH., CO-EVOLUTION Q., MOTHER EARTH NEWS. Some directories containing lists of mainly domestic (and some international) soft technology organizations, activities, and publications are: *Intermediate Technology's Selected Directory of Intermediate Technology People and Organization in the U.S.*, Report No. 7, INTERMEDIATE TECH. 1 (Summer 1978); NATIONAL SCIENCE FOUNDATION, APPROPRIATE TECHNOLOGY—A DIRECTORY OF ACTIVITIES AND PROJECTS (1977); CITIZENS' ENERGY PROJECT, CITIZENS' ENERGY DIRECTORY (1978).

33. Some idea of the broad scope of international activities in soft technology is given in LUTHERAN WORLD SERVICE, VILLAGE TECHNOLOGY HANDBOOK (1977).

domestic soft technology movement expresses another even broader aspect of its amalgamating, blending, synthesizing character.<sup>34</sup> In fact, probably the most interesting and important feature of the domestic soft technology notion is the way it attempts to incorporate, in one ideology, aspects of the concerns of environmentalism, the counter-culture, feminism, poor people's movements, and the disillusionment with international economic development in the Western technology transfer mode.<sup>35</sup>

The soft technology notion is new age politics because it differs from traditional political notions, especially left-right notions, in both substance and strategy. At the same time, the soft technology notion incorporates certain elements of both socialist and capitalist ideology. But economic growth in the hard technology mode is considered in soft technology thinking as incompatible with environmental quality, basic human needs, social equity, humane values, and the quality of life. Thus, although soft technology is clearly left-leaning, it does not lean toward the far left. It is incompatible with centralized, industrialized, hard technology, abundance-oriented socialism *and* capitalism. Further, it is evolutionary and incremental rather than revolutionary. Soft technology advocates generally acknowledge that some degree of power-orientation will be necessary to remove institutional barriers and provide incentives to stimulate soft technology deployment. But the soft technology notion involves a fundamental belief that immediate, voluntary changes by individuals, families, firms, neighborhoods, communities, states, and regions are not only possible but are an imperative feature of moving toward a soft society.

This amalgamation of environmental and other values, of right and left political notions, and of power- and participation-orientation is perhaps best illustrated in the contents of some of the periodicals of the movement. Recently, for instance, *Co-Evolution Quarterly*<sup>36</sup> included (1) an article by a liberal economist discussing how he had been partially persuaded by the conservative ideas of Milton Friedman and, indeed, how Friedman and Ivan Illich (an explicit soft technology advocate) were saying virtually the same thing about medi-

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34. See H. HENDERSON, *CREATING ALTERNATIVE FUTURES: THE END OF ECONOMICS* (1978); M. SATIN, *NEW AGE POLITICS* (1978).

35. D. Morrison, *Energy, Appropriate Technology, and International Interdependence* (Aug. 1978) (paper presented at the Annual Meeting of the Society for the Study of Social Problems, San Francisco), *reprinted in* *ENERGY, ENVIRONMENT, AND BEHAVIOR* (C. Wolf & C. Unsel'd eds., in press).

36. *CO-EVOLUTION Q.* (June 21, 1979).

cine;<sup>37</sup> (2) an article on the Three Mile Island incident stressing the relationship between nuclear energy and concentrated political power; (3) an article on the health impacts of pesticides on women that also suggests the probable impacts of collective action by small groups in the reform of pesticide programs of large federal agencies; (4) an article on the possibilities of profitable small entrepreneurship in using horses in certain foresting applications; (5) an article by a Vietnamese writer advising the Third World on strategies to protect its interest by establishing a new international information order; and (6) the usual array of information on books, hardware, and technological processes to enhance self-sufficiency, energy efficiency, frugality, coping, understanding the world, relating to the natural environment, and so on.

The *Co-Evolution Quarterly* and the earlier *Whole Earth Catalog* (first published in 1968)<sup>38</sup> also serve to indicate that development of the domestic interest in soft technology was somewhat parallel to and somewhat independent of the energy crisis and the broader international interest in soft technology stimulated by Schumacher. The "whole earth" notion, of course, implies an easy receptivity to the concerns of Schumacher on the part of *Catalog* buffs, among whom environmentalists were prominent.<sup>39</sup>

### *Environmentalists and Energy Alternatives*

The most visible, positive manifestation of the domestic soft technology movement occurred on Sun Day, May 3, 1978, an event that amplified and generated many new voluntary and some institutional organizations around soft energy in a mood of enthusiasm reminiscent of Earth Day 1970. Sun Day and subsequent developments were led and supported by basically the same leaders and organizations associated with the earlier celebration of environmental concern.<sup>40</sup>

37. The reference to Friedman is to a speech to the American Medical Association (uncited by the CO-EVOLUTION QUARTERLY author) in which Friedman applies the principles of his CAPITALISM AND FREEDOM (1962). The Illich book is MEDICAL NEMESIS (1976). See also I. ILLICH, ENERGY AND EQUITY (1974); I. ILLICH, TOOLS FOR CONVIVIALITY (1973).

38. S. BRAND *et al.*, WHOLE EARTH CATALOG: ACCESS TO TOOLS (various editions, 1968-1974). Brand is also editor of CO-EVOLUTION Q.

39. Also a substantial segment of the "counter-culture" was well represented among CATALOG readers. For an analysis that makes the counter-culture-soft technology connection clear see T. ROSZAK, THE MAKING OF A COUNTER CULTURE: REFLECTIONS ON TECHNOCRATIC SOCIETY AND ITS YOUTHFUL OPPOSITION (1968). Roszack's increasing concern with environmental problems and his attraction to soft technology as a solution to the interrelated set of environmental, humane, equity, and quality of life problems is seen in his recent book PERSON/PLANET ((1978).

40. For instance, Denis Hayes was a major organizer of both Earth Day and Sun Day. Friends of the Earth was the publisher of the official book of Sun Day, SUN: A HANDBOOK FOR THE SOLAR DECADE (S. Lyons ed. 1978).

Soft technology also has achieved considerable public visibility through its flip side, the anti-nuclear movement.<sup>41</sup> Here also the relationship of soft technology and environmentalism is seen concretely, if incompletely: the anti-nuclear movement has its major personnel and organizational base in the environmental movement, especially in the new and more radical organizations like Friends of the Earth and Environmental Action.

It is important to note, however, that while the anti-nuclear movement clearly endorses soft energy as the alternative to nuclear, soft energy enthusiasts are not necessarily anti-nuclear, visibly pro-environmental, or involved at all in the political-economy critique that is central to the soft technology notion. In particular, many of the producers, distributors and consumers of soft energy *hardware* doubtless are motivated solely by economic considerations or by fascination with the technology per se. The same is probably true of much of the larger public, where pro-solar *and* pro-nuclear attitudes are seen as perfectly consistent with the desire for increased domestic energy supply as an alternative to imported oil dependency and escalating energy prices.

Still, the overlap of soft energy advocacy on *ideological* grounds, anti-nuclear sentiment, and environmentalism is considerable. In all likelihood it will grow in the wake of events like Three Mile Island, the subsequent reservations raised in the investigatory commission report,<sup>42</sup> the showing of the *China Syndrome*, and media attention to any problems in nuclear energy plants. The continuing debate over energy alternatives is increasingly a political-economy debate over broad issues at the heart of the soft technology movement, rather than a narrow debate over costs and specific environmental impacts. This debate is both generated out of and having an impact on environmentalism.

Soft technology thinking increasingly is penetrating environmentalism, especially through its younger and more radical elements, and through the severe pressures environmentalism is experiencing because of the energy situation. Energy prices continue to escalate and play an obvious role in continuing inflation, bringing to bear strong, well-organized growth forces promoting accelerated development of conventional energy sources and correspondingly lower environmental standards. This is seen clearly in the "fast tracking" pro-

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41. For an analysis of the anti-nuclear movement, see Mitchell, *The Nuclear Debate* (Feb. 1978) (paper presented at the meetings of the American Association for the Advancement of Science). For a description of the movement from a strong advocacy perspective, see H. WASSERMAN, *ENERGY WAR* (1979).

42. REPORT OF THE PRESIDENTIAL COMMISSION ON THE ACCIDENT AT THREE MILE ISLAND (1979).

cedures of the Energy Mobilization Board—and in environmental fears of such a notion.

It is clear that the set of problem themes discussed above will be important in conflicts about energy, as well as in other environmental issues. It is clear, too, that answers that satisfy environmentalists, their adversaries, and even their friendly critics are not found easily in the framework of environmental values and concerns reflected in the environmental reforms to date.

While many environmentalists have some reservations about the soft energy alternative and even more reservations about the broader soft technology notion, the soft energy alternative is one—and perhaps the only—available, positive, programmatic energy alternative that explicitly incorporates environmental values. Without it environmentalists are on the defensive in environment-energy conflicts. This situation clearly suggests that if environmentalism is to play a role in these conflicts we will see it increasingly concerned with the soft technology notion.

The conflict between advocates of soft and hard technology, and more specifically the conflict between soft and hard energy advocates, promises to occupy a place in society for some time to come, with environmentalists playing an important role on the soft side. But it is also important to note that, because of the way the soft/hard energy conflict is developing, not all environmentalists will be comfortable in this role.

A substantial part of the domestic soft technology movement has a distinctive counter-culture, anti-establishment, and (as mentioned above) mildly left-leaning flavor. As a consequence, many persons on the left are attracted to the soft technology notion, and most especially to the direct-action tactics being used by a segment of the anti-nuclear movement. Considering the compositional character of the core environmentalists (i.e., white, professional, affluent) and given the respect, influence, and institutionalized power that environmentalists have won in hard battles during the last decade or so, it is likely that the ideological, compositional, and tactical character of the joint anti-nuclear/soft technology cause will generate some political ambivalence about soft technology among core environmentalists, especially those in the older organizations.

Some environmentalists, for instance, doubtless are asking themselves if ridding environmentalism of the image of elitism is worth the risk of acquiring the image of radicalism associated with anti-nuclear civil disobedience.<sup>43</sup> More broadly speaking, the situation will create

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43. Metzger, *The Coercive Utopians: Their Hidden Agenda* (1978) (paper presented at the national meeting of the American College of Nuclear Medicine) provides an example of

uncertainties as to whether it is in the best interest of environmentalists and their organizations to align explicitly with soft technology advocates and organizations. So many core environmentalists and their organizations probably will endorse soft technology in a general way, specifically endorse soft energy and adopt anti-nuclear positions, but attempt to keep themselves and their organizations clearly separate from the newer organizations that consciously incorporate environmental and broader concerns under the soft technology rubric and rationale. In particular, core environmentalism will strive to separate itself from the more radical elements and activities in the anti-nuclear movement. This will not be easy, however, as the nuclear issue, including the issue of strategies and tactics, promises to become increasingly controversial.

#### SUMMARY AND CONCLUSION: THE HARD REALITIES OF SOFTENING

The environmental movement in this country and the soft technology movement overlap in personnel, resources, organizations, and ideology. The most specific, visible manifestation of this overlap is in the new domestic soft technology groups: in a true sense they are at the intersection of the environmental movement and the broader, international soft technology movement. Beyond this, there is an increasingly diffuse and mainly ideological overlap and interpenetration of these movements. Soft technology thinking in environmentalism is broadening its concerns. This trend tends to increase what to date has been environmentalism's rather marginal relevance and legitimacy in the original and still central domain of the soft technology movement, namely the developing countries.

This "softening" of environmentalism, in turn, will give the broader, international soft technology movement an enhanced legitimacy and respect, a basis for respectability in the developed and developing countries, and, most important for soft technology, a ready-made, sympathetic constituency and associated base of both voluntary and institutionalized power in environmentalism.

This paper has not attempted to deal with the difficult and important matter of the veracity of the claims made on behalf of soft technology. But there are important unanswered and probably presently unanswerable questions about the validity of the claims for

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the kind of nonenvironmentalist reaction to the anti-nuclear movement (and to soft technology advocates) that environmentalists are concerned about.



soft technology, including those made in behalf of soft energy.<sup>44</sup> These questions naturally are uppermost in the minds of soft technology critics, but they doubtless are also the source of some substantive ambivalence about soft technology among environmentalists, an ambivalence that will operate in addition to and in interaction with the political ambivalence discussed above.

"Small is beautiful," according to the soft technology advocates, but in truth soft technology is not in place. Until it is, there can be no definitive answer to the many questions raised about it by its critics, in particular the question, "Is small bountiful?" or perhaps more accurately, "How bountiful is small?" Will "small" let those who currently have small economic stature approach levels of living like those who have already gathered and secured the bounties of hard technology—including, importantly, those of the core environmentalists? Or, if not, are environmentalists willing to argue for a reduction in levels of living among the affluent, including themselves, to achieve environmental reform in the context of achieving greater social equity through redistribution?

These questions are exceedingly troublesome, especially the last one. But it is in fact the key question, since the soft technology notion strongly implies that current levels of affluence produced by hard technology can be neither maintained in the developed countries nor obtained in the developing countries.<sup>45</sup> This is a new and truly radical idea, fundamentally one about economic distribution, but also a theory about the quality of life and its technological and associated determinants in modes of social organization. Its essence is that the means and relations of production must be not only "regulated" as in current environmentalism, but transformed.

The current realism of environmental regulation will, of course, continue. But the soft technology vision of transformation to a soft society—some would call it a utopian vision—is the cutting edge of thought in environmentalism. It will be controversial within environmentalism and will change its organizational character and its ideology. In turn the softening of environmentalism will permeate, heighten, and change the future conflicts of environmentalists and their adversaries.

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44. See D. Morrison, *Should We Follow the Soft or Hard Energy Path? Some Social Science Considerations*, in PROCEEDINGS OF A WORKSHOP ON THE SOCIAL DIMENSIONS OF ENERGY POLICY (J. Cameron ed. 1980); D. Morrison, *Energy, Appropriate Technology, and International Interdependence* (Aug. 1978) (paper presented at the Annual Meeting of the Society for the Study of Social Problems, San Francisco), reprinted in ENERGY, ENVIRONMENT, AND BEHAVIOR (C. Wolf & C. Unseld eds., in press). See also note 31 *supra*.

45. See, e.g., Dunn, *Energy in Rural Areas: An Intermediate Technology Approach*, in INTRODUCTION TO APPROPRIATE TECHNOLOGY 65 (R. Congdon ed. 1977).