RESPONSE TO CRITIQUES OF *ETHICS IN AN AGE OF TECHNOLOGY*

by Ian G. Barbour

Abstract. Both Roger Shinn and Robert Stivers ask whether technology has a momentum of its own that is difficult if not impossible to control ("autonomous technology" or "technological inevitability"). I reply that the difficulty in controlling technology is a product of economic and political institutions (such as corporate lobbying and campaign contributions) rather than of any inherent characteristics of technology. Against Stivers's assertion that the ecosystem should be the center of value in environmental ethics, I defend the process view that all beings are valuable, but they are not equally valuable in their richness of experience or their contribution to the experience of others. I also consider his caveats about ambiguities in the concept of sustainability. Two questions raised by Mary Gerhart are taken up: the difficulties of interdisciplinary writing and the role of theological ethics in discussions of public policy. In dialogue with Frederick Ferré I explore the role of alternative visions of the good life as a source of social change. In the face of diminished concern about social justice and environmental sustainability among citizens and in Congress since the book was written, I express long-range hope, but not optimism about the short-term prospects for change.

Keywords: environmental ethics; politics; process philosophy; sustainability; technology.

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I am grateful for the care with which these four critics have read the second volume and reflected on the issues it raises. I will again focus primarily on our points of difference, though I am aware we share many assumptions that are widely challenged in our culture.

RESPONSE TO ROGER L. SHINN

Let me take up four issues raised by Roger Shinn. In his comments on Part 1 ("Conflicting Values") he asks about technology and politics. One question is how Congress can make decisions about policies that have technical components. A generation ago, Congress made decisions about technologies concerning which virtually the only experts were employees of corporations or government agencies with a vested interest in the technology. Since then there has been considerable improvement in the availability of technical expertise from a variety of sources: the National Academy of Sciences, the Office of Technology Assessment, universities, and public interest groups.

But the other political problem that Shinn mentions has been getting worse, namely, the advertising campaigns and election contributions by interest groups or corporations promoting particular technologies or programs. Health care reform, as he says, is one of the worst cases in the history of such lobbying. In the chapter on technology and government (chap. 8) I discussed the need for legislation to reform campaign financing and lobbying practices, and the need is even more urgent today. Members of Congress are reluctant to change a system from which they benefit, but I think an aroused citizenry could help to bring about significant changes. In particular, greater public financing of longer blocks of television time and limits on expenditures by candidates for TV ads could reduce the barrage of thirty-second ads which tend to oversimplify issues and encourage attacks on the character of one's opponent.

Shinn raises a second issue by quoting from my preface: "Provided that population growth is curbed, global resources are sufficient for every need but not every greed." This sentence was intended as a summary of my arguments that sustainability is threatened by ever-escalating consumption, and that many scarcities are the product of inequitable distribution. But Shinn is right that the line between what people consider needs and what they consider luxuries is historically and culturally relative. It is for this reason that in the chapter on human values I refer not to needs but to "basic needs" as a subject of particular ethical concern. I say that inequalities in access to resources fulfilling basic human needs such as food and

health, which are conditions for life itself, are especially serious violations of justice.

To be sure, maintenance of physical health is only one of the reasons why people eat, but surely it is the most important one. I find it scandalous that American dogs are better fed than many children in Africa. Two hundred fifty thousand children die every week of malnutrition and the diseases associated with it, while we pay farmers to produce less. Rich nations can outbid poor ones in the global supermarket, so the best land in Central America is used for nonfood or luxury food crops for export rather than staple foods for the local population. Shinn asks: "Do I really want a world with no flowers?" I would answer: No, but I can get along without carnations grown for export on land formerly used for subsistence agriculture in Colombia.

Shinn says that human demands seem to be insatiable. I proposed that we must combine several approaches to slowing the growth of consumption in affluent societies. We can appeal to a sense of justice in a world of limited resources, but that is not likely to be effective. We also must hold up a positive vision of the good life that is less resource-consumptive than the version with which we are constantly besieged in TV ads for consumer products. Our culture urges us to fulfill all our psychological needs through consumption. The Christian tradition holds that true fulfillment is found in spiritual growth, personal relationships, and community life. This path is life-affirming, not life-denying. Religious faith speaks to the crisis of meaning that underlies compulsive consumerism. We should seek a level of sufficiency that is neither ever-growing consumption nor joyless asceticism. I suspect that a vision of positive possibilities and an alternative image of the good life are more transformative than moral exhortation in helping people turn in new directions.

Third, Shinn says that he has become more sympathetic to Jacques Ellul's thesis that technology is an autonomous force with its own direction and momentum, which we are powerless to control. I share Ellul's conviction that the total network of interconnected technologies is more powerful than any one technology, and it is extremely difficult to redirect. But I believe the difficulty lies in the political institutions in which large-scale technologies are now embedded, rather than in any inherent or autonomous characteristics of technology itself. My case studies on energy, agriculture, and computers give many examples of the economic power and the research priorities of technologically based corporations and illustrate their ability to influence the political process. They underscore the importance of campaign financing reform. I grant that changes in public

attitude and perception occur only slowly and that we have been mesmerized by the promises of technology. But I still retain a faith that when enough people are concerned in a democracy they can be politically effective. Despair is a self-fulfilling prophecy because it undermines all attempts at change.

As further evidence against technological determinism one could cite the movements for appropriate technology discussed in the chapters on energy and agriculture and in the final chapter ("New Directions"). To be sure, these alternative technologies are practiced by only a minority of people in industrial nations or in the Third World, and they rely on local rather than national resources and institutions, but they do suggest that human values and social institutions, along with inherent characteristics of technology, influence the kinds of technology we deploy.

The final question raised by Shinn is whether I have given too little attention to the tragic elements in life and the intractability of many of these issues. He says that "the only solution to many problems is eschatological." If that means that the Kingdom represents an ideal we cannot expect to achieve within history, I agree. If it means that we can move closer to that ideal only with God's help, I would again agree. But significant changes in social institutions can occur when enough people are concerned. Yes, as Shinn says, "people in power usually prefer to maintain their position in an unjust world." But slavery has been abolished in most nations. Racial and gender discrimination are still severe, but women and minorities have opportunities that were only dreamed of thirty years ago. Many of our children have a much greater environmental awareness than we did at their age. Major changes in the way we treat the environment require changes in attitudes, perhaps even a paradigm shift, but the combination of continuing crises and alternative visions of the good life might encourage such a shift.

RESPONSE TO ROBERT L. STIVERS

Stivers's delightful essay looks at my environmental ethics in the light of the conflict between birds and power boats in Puget Sound. The dominance of the boats seems to him to be an example of "the inexorable ocean swell–like quality of our technological society." Like Roger Shinn, he finds merit in Ellul's argument that technology is an autonomous and unstoppable force. But do not Stivers's own advocacy of a sustainable society and his efforts for legislation to preserve old-growth forests in the Pacific Northwest imply that he does not consider himself powerless against technological inevitability?

Sustainability is, as he says, a vague and ambiguous term which can be interpreted in various ways according to one's ideological assumptions and class interests. He could have cited the diverse interpretations of "sustainable development" in international policy discussions since the Brundtland Report in 1987. Nevertheless, I believe that sustainability is an important concept. It directs us to look at long-term consequences (even if we use differing assumptions in estimating them), and thereby it broadens the short time frame used in almost all economic and political analyses. It also requires us to consider the indirect and unintended consequences of our actions. I take Stivers's comment here as a warning about the ease with which a term can be co-opted for purposes contrary to those orginally intended, rather than as a recommendation to avoid use of the term. He himself wrote in 1976 a helpful book entitled *The Sustainable Society*, and he continues to list sustainability among the values we should seek (along with justice, equality, participation, and sufficiency).

In an interesting article on the conflict between spotted owls and the timber industry, he writes: "The owl is part of a whole system, and the human species needs to keep whole systems intact in order to survive. That is what sustainability is all about." After examining ideological factors in differing definitions of sustainable yield in forestry, he concludes: "It may in some cases even be used rhetorically to cover unsustainable practices. Nonetheless it is a useful concept, around which there is considerable consensus" (Stivers 1993). I agree with him that ideological assumptions also underlie the wider debate over "limits to growth." My own discussion (pp. 188–89) pointed in particular to the optimists' confidence that technological advances and free-market adjustments will provide adequate responses to resources scarcities and the pessimists' misgivings about those assumptions.

Stivers rightly criticizes my meager use of the writings of black, Hispanic, and Third World theologians. One of the themes running through every chapter of the book is that the benefits and risks of technology are inequitably distributed. The urban poor, for instance, are exposed to a disproportionate burden of pollutants. But the racial as well as economic factors in such inequities need to be brought out more frequently. I noted that the majority of toxic waste dumps are located in predominantly black and Hispanic communities, and that migrant agricultural workers exposed to pesticides are usually Hispanic, but many other examples of environmental discrimination could be cited. In the past, Latin American liberation theologians have had little to say about the environment, but Leonard Boff's

recent *Ecology and Liberation* (1995) brings together a passion for social justice and a strong concern for the world of nature. We should listen to the voices of the oppressed before we try to act in solidarity with them.

The most significant divergence between Stivers's thought and mine lies in his endorsement of ecosystem ethics. We both reject the anthropocentric belief that only human beings are valuable. Process thought avoids the body-soul and body-mind dualisms which lie behind the separation of human beings from all other creatures in Western thought. But it holds that beings capable of higher levels of experience are more valuable than those without such richness of experience. Stivers quotes me as saying that it would be justifiable to kill animals if that were necessary to obtain protein for starving children, but I go on to say: "Actually, feeding grain to cattle in feedlots is detrimental to both the human food supply and animal well-being, so we do not have to choose priorities in that case" (p. 71).

Stivers fears that belief in a value hierarchy among living forms, coupled with our power over other creatures, will lead us to exploit them without restraint. "Imaging ourselves as superior," he says, will legitimate all forms of predation. I welcome his stress on the importance of ecosystems and his inclusion of humanity in the natural world. But I wonder if his own view might not be equally liable to be misused to justify human predation. He says, ". . . all plants and animals survive as individuals and species only as they participate in communities (ecosystems) where each individual of a species uses individuals of other species as resource to assure its continued life, and in turn defends itself against the efforts of others to do the same." Some suffer and die, he continues, enabling others to live, for we all "consume and are consumed." But does the realization that in an ecosystem we harm ourselves if we go too far in destroying other creatures provide them with sufficient protection against our consumptive habits—or should we respect their own inherent value in addition to their contribution to us or to the ecosystem? The latter option would take us beyond ecosystem ethics as usually understood.

I view process thought as a middle ground between the holism of ecosystem ethics (which makes the system the locus of value to which individuals should be sacrificed if necessary) and the individualism of the animal rights movement (which, like all talk of rights, makes individuals the locus of value). Process thought portrays the inter-relatedness of all entities (each constituted by it relationships), but it is pluralistic in distinguishing a variety of centers of experience, each

valuable to itself, to other entities, and to God. While it does allow us to assign grades of value to the richness of experience of which different types of life are capable, it provides no grounds for discrimination among human beings of the sort found in social hierarchies and oppressive social structures. At that point process theologians join liberation theologians in working for social justice.

RESPONSE TO MARY GERHART

I am not sure how to respond to Mary Gerhart's statement that my book is difficult to read. She says it is not a question of organization or strategy, which she characterizes as superb. She grants that any challenging writing on complex issues will require rereading. She expresses appreciation that the book encourages communication between groups that do not usually speak the same language. But I know students do find both these books difficult and that they are more suitable for advanced undergraduates, graduate students, and faculty than for first-year undergraduates or laypersons. Any presentation of interdisciplinary issues is inherently difficult. I tried to explain the crucial ideas in each of the disciplines from which I drew in a way that I hoped would be intelligible to someone without much background in it, but I am sure I often failed to achieve this goal. Gerhart, as a theologian, has done much of her writing and teaching jointly with a physicist, Allan Russell, and that seems to me an excellent model for interdisciplinary cooperation.

Gerhart asks: "Is it likely that *Ethics in an Age of Technology* will draw the reader into the heuristic of doing science and doing religion?" This volume tries to deal with technology and ethics rather than with science and religion as such. Moreover, I do not think of myself as trying to get people to *do* either science or technology. I frequently discuss issues faced by scientists and engineers, not in the abstract, but in their work in agricultural research, the nuclear reactor industry, computer programming, and so forth. Perhaps more discussion of the practice of science and technology would have been helpful. In most cases I prefer to focus on policy questions concerning technology (for example, public policy decisions about agriculture, energy, and the environment). Such policy choices are by nature interdisciplinary. They involve technical and ethical issues to which scientists, legislators, and citizens all can contribute.

She asks how my two volumes are related to each other. Since the issues raised by science and by technology differ somewhat, they will interest different though sometimes overlapping groups of readers, and I wanted each volume to be useful on its own. I had in mind, for

example, that the second volume might be used in some courses in engineering schools, and this has indeed occurred. Because engineering and technology are usually studied in public or secular universities, I discussed science, philosophy, and religion as possible sources of ethical norms and not religion alone. I included some theological analysis, but gave it less emphasis than in the first volume. This was also required by my focus on policy issues in the public arena. In Chapter 2, I argued that within the life of the church there is an important role for an ethic of obligation and an ethic of virtue, as well as for H. Richard Niebuhr's ethic of response to what God is doing. But I said that in the public policy arena choices should be presented in terms of values such as justice, freedom, and environmental preservation on which Christians, Jews, and others can find common ground. I also tried to explore the distinctive Christian grounds for each of these values.

Despite the hope that each volume could stand alone, I wanted to relate them to each other and to provide cross-references at a number of points. I suggested that the evolutionary, ecological, and many-leveled view of nature and the evidence for the kinship of humanity and nature in the first volume provided a basis for the environmental ethic developed in the second volume. The doctrines of creation and human nature in the first book, informed by both biblical theology and contemporary science, support the theological discussions of ethics in the first three chapters and the last chapter of the second book. Process thought is referred to in only a few passages but hopefully enough to suggest some connections. I also explored the relationship between science and technology at several points.

Two final comments. I will try not to use the gendered term *landlord* in the future. I usually use the terms *landowner* or *landholder*, which are preferable. Unhappily there are all too few women land-holders in the Third World; the example Gerhart proposes, *Out of Africa*, was the story of a white Western woman, not an indigenous woman. I would prefer Willa Cather's *O Pioneers!* rather than *Gone with the Wind* if I were choosing an example from our own nation. One could also cite a recent study in support of Gerhart's point. Women now operate 7.5 percent of our farms and own 40 percent of our farmlands, and they often face gender prejudices on the part of their families, banks, and other farmers (*Minneapolis Star Tribune* 1995).

She also wishes I had discussed colonies in space. I am not sure what light that would have shed on the discussion of agriculture, energy, or the environment on the earth. Instead of putting a handful of people into space at enormous cost in money and energy, I believe we should concentrate on urgent problems closer to home. We are

unlikely to find elsewhere in space a habitat which is as hospitable as the earth with which we share a common evolutionary history. If we cannot solve on earth the social problems which may indeed threaten our survival, we would probably take them with us into space.

RESPONSE TO FREDERICK FERRÉ

Drawing from Whitehead, Ferré suggests that major historical changes are the product of two factors: the push of efficient causes such as economic institutions, technological systems, and environmental constraints, on the one hand, and the pull of final causes, including human values, ideals, and visions, on the other. He notes that the fall of the Berlin Wall was caused both by the economic inefficiencies of the governments of Russia and Eastern Europe and by the ideals of human dignity, democracy, and freedom that contributed to the desire for change.

Ferré directs us toward the last of the four sources of change that I examine in the closing pages of my book. After acknowledging the enormous obstacles to change and the entrenched power of those who benefit from the status quo, I discuss: (1) education through schools, universities, churches, and citizens' groups; (2) political action, especially through more effective coalitions among movements for justice and the environment; (3) social and environmental crises as catalysts for action; and (4) visions of alternative possibilities that can motivate action for change. I point out that catastrophes alone, without alternative visions, may simply lead to reliance on technical fixes or authoritarian measures.

I am usually accused of being too visionary, so it is refreshing to be told that I am not visionary enough. I agree that we need preaching, prophecy, and poetry to inspire us, though I am not sure that they would have been appropriate in the context of the Gifford Lectures. I am puzzled by Ferré's reference to the importance of "impossible dreams," which echoes Shinn's statement that insoluble problems are only resolved eschatologically. I would say that the attractive power of an alternative vision of the good life is precisely that it is a real possibility, even if we expect to achieve it in only a fragmentary way. Ferré closes with my quotation from Dom Helder Camara: "When we dream alone, it is only a dream. When we dream together, it is no longer a dream but the beginning of reality." Surely Camara is talking about possible dreams, not impossible ones.

We have to distinguish among vision, hope, and optimism. I take vision to be an imaginative portrayal of an alternative pattern of life capable of at least partial realization within the limitations of human

nature and history. Long-range hope is always needed, for without it, as Ferré acknowledges, despair undercuts all efforts at change and becomes a self-fulfilling prophecy of resignation to the inevitable. Optimism refers to the immediate prospects for positive change, and it varies with the historical circumstances. I wrote the final draft of this book after the fall of the Berlin Wall and as the Reagan and Bush years were ending, and I saw some grounds for optimism. Since then, the plans of the Clinton administration have seen only very limited fulfillment. Al Gore presented an inspiring vision in his book *Earth in the Balance*, but his opportunities of implementing it have been greatly constrained by the attitudes of the U.S. public and the political realities of his office. The 1994 election and the actions of a Republican-controlled Congress have been very discouraging in showing diminished concern for both justice and the environment among citizens and political leaders.

Major progress toward a just and sustainable society is indeed dependent on fundamental changes in attitude, which requires education and imagination to spread the vision. Paradigm shifts in society involve new perspectives, new ways of seeing and interpreting the world. Science can help us to see ourselves as part of an interdependent world. Religious faith can help change our attitudes toward nature and toward other peoples, and it can present an alternative vision of the good life. We also can be much more active in altering our individual lifestyles and in building local communities that are more sustainable. Perhaps as the prophets of ancient Israel said, we have traveled so far down unjust and destructive roads that we cannot expect to avoid judgment and suffering. But those same prophets said that beyond judgment there is hope of renewal if we repent and acknowledge God's purposes for the earth and all its creatures. So I end on a note of hope rather than optimism.

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