Response to My Readers

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I hope no one is disappointed when I say right at the start that I basically agree with my critics. Not all is irenic, of course, and in philosophy it should not be. What distinguishes the philosophical from the poetic or the narrative discourse is the expectation of questions and objections. Much as I appreciate Myron Tuman's generous remarks on the occasionally poetic quality of *Holding On to Reality* (henceforth *Holding*), I have always enjoyed the give and take of philosophical exchanges though I have tried, over the years, to be gentler in giving and stronger in taking (Borgmann 1999). There are then misunderstandings and confusions that I have discovered in the contributions of my readers, but I found insight to prevail, and the region between fundamental agreement and occasional misapprehensions I take to be the unsettled area that calls for collaborative and complementary investigations.

As Phil Mullins has noted, *Holding* has been read in different contexts, and one may well ask if it was meant to be read in one principal context. The readings of Mullins and Charles Ess come closest to what I had in mind. As Mullins has it, I used a semiotic envelope to make a metaphysical point. Though I do not use this terminology, I entirely agree with Mullins's point. I wanted to use the notion of information to cast light on the kind of reality we find ourselves in today, and a lot of tasks and details followed from this basic concern.

One concern was to take seriously what today is meant by information, to point out the assumptions and limitations of these common understandings, and to broaden the current concept of information. Acting on that concern inevitably involves one in semiotics. As Mullins points out, I employ "a rather commonsensical relational view of human sign use." The worst problem I had in writing this book was trying to cope with the way information hides behind too much information. There is an extensive and an intensive dimension to this predicament. Extensively, too much has been written about information. Intensively, the pursuit of information or sign use in a particular research program can exfoliate into those many types, distinctions, and qualifications that only the specialist of a particular school can love and care for. I pointed this out for the relational approach (*Holding*, p. 237, n. 2). I could have pointed it out for semiotics as an academic field as well.

As is the case with Ernst Cassirer and Susan Langer, professional semiotic ambition, moreover, begins to absorb all there is in human activities and regions of reality (Cassirer 1953, pg. 73-114; Langer 1951). I have had no such comprehensive ambitions, at least not since the publication in 1974 of *The Philosophy of Language* - not a book I recommend; it deservedly fell deadborn from the press (Borgmann 1974). In *Holding* I use history to dislodge entrenched positions, to make systematic points, and to give these points a memorable order. This approach also is my excuse to Tuman's charge that I give a "severely one-dimensional" account of modernism.

What semiotics I have used is rudimentary and has been available at least since Aristotle, and as Mullins points out, it is restricted to human sign use.[1] Natural information is further confined to distant reality, cultural information to instructions for realization, and technological information to virtuality. There is, however, a crucial proviso to the way these restrictions are stated. They are aimed at the distinctive functions of each kind of information. In addition to their distinctive properties, cultural and technological information also perform the functions of their predecessors, if in a potentiated form. Thus the three types of information are connected by historical sequence and by common functions.

The inspiration for the semiotics of *Holding* could have come from Peirce as Mullins shows, and Mullins is right also about the basically triadic structure of the information relation. I expanded it to a pentadic relation, prompted by Fred Dretske and Keith Devlin. The relation could have been elaborated further and relativized to time, place, truth value, and any number of modes and codes, but here Devlin's example served as a warning not to sacrifice clarity to endless sophistication. In addition I was guided by a basically Fregean semantics and an inclusive scientific realism though with a crucial metaphysical qualification.

Mullins correctly thinks of the metaphysical claims as central even though they are enveloped in semiotics. These fundamental concerns are metaphysical in dealing with the basic questions of what kind of world we live in. They are not metaphysical insofar "metaphysical" means necessary or universal. At least the contingent side of reality is thoroughly historical, and the historical issue in question is the decline of meaning. Meaning is ultimately not a human projection or formation, as Cassirer has it, but the eloquence of reality (Cassirer, pg. 105-114).

As for the largely historical character of the basic texture of reality and the characteristically modern reweaving of that texture, I have drawn most encouragement and confirmation from Charles Taylor. This view of the world is realist as Mullins says, but it is a special kind of realism as again Mullins sees clearly. I have learned it, more than I realized when I wrote the book, from my friend and colleague Gordon Brittan who has developed it as a strikingly distinctive and insightful reading of Kant.[2] I have come to call it relational realism, and I agree with Mullins that it goes beyond simply holding "that there are mind-independent entities" - a view I call and criticize as "absolute realism."[3]

Part of an inclusive scientific realism is the acknowledgment that whatever is real is so as the nexus in a causal network. Hence whatever "semiotic action" is, as Fernandez calls it, it must be physical causation too. But Fernandez is right in demanding a distinction, for causation underdetermines signification, as philosophers put it. Everything is causes and effects, lawfully linked, and seeing that this is so, is not the same as seeing what causal chains or bundles are eminently meaningful or eloquent. To be a cause of an effect is to have *some* meaning, but it is not the significant meaning that animates reality and engages humans.

I have dealt with this problem under the headings of structure and meaning, and to get from causal processes to semiotic action is to get from structure simply to meaningful or significant structure. How do we accomplish this? The answer is: Basically we don't. We cannot do it by analysis, we cannot do it by synthesis — two systematic points made historically in *Holding* (pp. 57-64 and 64-74). Modern philosophers have wrestled with the problem to no avail (pp. 10 and 27-28). Thus the connection between causality and semiotics is a central concern of *Holding*, albeit under the headings of structure and meaning. In one place, however, the pivotal point is stated in more conventional terms:

> A multitude of causal lines connects thing, sign, and recipient. Scientifically explicated causality, however, underdetermines meaning and information. Hence we must acknowledge terms like eloquence, reality, intelligence, presence, reference, etc. as primitive.

"Primitive" does not mean unexplainable, of course; all it means is that the meaning of reality cannot be defined in more fundamental terms. At any rate, the passage in question is an endnote (*Holding*, p. 239, n. 23) and perhaps too easily overlooked.

When I call scientific realism inclusive, I mean to accept the reality of the entities and forces physical theories talk about, but I include higher level theories and languages-poetical or moral language, say - as being indispensable and having a dignity of their own. My qualification of Fregean semantics concerns the notion of intentionality that usually goes along with it, where the "aboutness" of a sign is grounded in human subjectivity.

When metaphysical issues are pushed to the limit, questions arise about the beginning and end of all things, about misery and evil, and about the final meaning of human life. Religion tends to answer these questions in one way, and atheism in another. Ess picks up on the religious way these questions are settled in *Holding*, and in doing so he has certainly uncovered an issue that has been important to the project. At the same time, I have always been concerned to share as much common ground with atheists as possible.

Thus atheists of my acquaintance have agreed to the importance of focal celebrations. All people of good will, moreover, have to admit that, within a global perspective, our celebrations, no matter how rich and festive, take place amidst poverty and misery; and within a moral perspective, our celebrations, no matter how generous and affirmative, take place amidst our self-regarding calculations and our despondent abdications.

There are several honorable replies to this predicament. One is the melancholy acceptance of misery and evil, combined, perhaps, with the heroic determination personally to do what good one can. Another is the belief in technological progress and human perfectibility and the conviction that in time physical misery and moral failings will be overcome. A third is the Christian answer. Because there are these responses and many more, I offered, in *Holding*, the Christian response as an example, not as sole salvation. But even so, as Ess rightly insists, there are different Christian and in fact different religious responses.

I would plead a vision halfway between the prophetic and the apocalyptic positions as Ess understands them. In agreement with the prophetic position, I think of humans as essentially embodied and as inhabiting a world that is fundamentally good and at times is more than good, i.e., eloquent and magnificent. It is so in celebration.

In one sense, the Kingdom of God has arrived - we have been redeemed, the world is filled with grace.[4] But this must be rather variously so. What about people who died in utter pain and misery, unmourned and entirely forgotten? My point is that they too will be remembered and redeemed. But evidently, this did not and can no longer happen *"in this world* and *in this life*" as Ess suggests. In any case: "All of us will be remembered..." (*Holding*, p. 233). That means all human beings.

The recovery of the "original harmony between Creator and creation," as Ess puts it, is underway now, but is so in varying degrees though I would not deny that it is gradually coming closer in this world, all things considered, and all of us obviously should dedicate ourselves to making this a better world if only because misery is so miserable and celebration so festive. But I cannot see the recovery ever becoming final in this world. Hence I agree with the apocalyptic tradition to this extent: The completion of recovery will come to pass at the end of this or in another world. All this leaves us with difficult theological and exegetical problems. That all human beings will be saved is a minority view among Christians, and all Christians have a hard time, theologically, with the resurrection of the body and the relation of history to eternity.

Perhaps, Ess might say, there is still an apocalyptic tone to some of the criticisms of the culture of technological information. The final quotation of the book, moreover, is from a text that is familiar from the dark and unsettling music it has been set to by Mozart in his *Requiem*. I suggest a consoling and conciliatory reading of the lines I quote. Mozart appears to agree. There is a striking change from the menacing to the pacific when the Requiem reaches this passage. At any rate I endorse the reading of *Holding* that Ess advances as the principal one.

If Ess thinks that I am too pessimistic about the world as it is, Myron Tuman thinks I am occasionally too optimistic. He would have liked me to acknowledge Vico as a progenitor in my critique of technological progress (something I did in *The Philosophy of Language*, pp. 73-80). Tuman particularly doubts that it is possible to show how "a >progressive' social agendum is to be reconciled with a more basic and generally conservative view of the family (gathered around the stove) and community celebrations generally." Well, here is an example. I support Tuman's generous view of social life, and I would like to include the family in such generosity — a family is any two or more people who have cast their lot together, two women, two men, a woman and a man, more than two, any two with children or without. At the same time I urge fidelity among the partners, love and discipline toward children, common meals for the entire family, and engagement in the life of their communities. The socially progressive part should be secured by law. The culturally conservative part is a matter of example, education, and publication.

Tuman expects me "to harbor and express some lingering concern about the traditional anti-intellectual edge of community celebrations, or at least point out what has changed so much from European culture of the first half of the twentieth century where so much anti-Semitism was fueled by the Jews as outsiders… "Tuman is right — this is a crucial issue, and it has concerned me deeply. One of the opportunities that a discussion of Freiburg Minster affords is to point out how impotent such a grand center for communal celebration has been in keeping virulent anti-Semitism at bay (*Holding*, pp. 116-18). I mention the holocaust once more in the last section of the book where, agreeing with Tuman, I urge remembrance as the duty we owe to that catastrophe (p. 229). There is, thank God, a glimmer of good news about the connection of tolerance, if not with communal celebration, at least with civic engagement (which does include some celebration). As Robert Putnam has found, tolerance is more vigorous among the communally active than the socially solitary (Putnam 2000, pg. 355).

I would like to suggest an underlying agreement also with Ess's concern about free market capitalism. We must, however, begin with the acknowledgmentof certain facts. It is simply the case that the planned or command economies have done poorly in delivering technological affluence and that they have for that reason lost credibility and contributed to the fall of most communist regimes. It is a further empirical fact that peace and prosperity have been most fully achieved within and among the advanced industrial countries.[5] Moreover, when one considers the developments of the now advanced industrial countries in the 19th century and the developments within the last decades of Korea, Singapore, Hong Kong, Taiwan, and Chile, it appears that liberty follows prosperity more often than vice versa. Finally, globalization is both inevitable and eventually beneficial.

The force of these facts has dampened some of our fondest hopes as regards socialism, social justice, environmentalstewardship, and appropriate technology. At the same time, it leaves room for many qualifications and criticisms. Any kind of capitalism that hopes to be healthy on merely economic terms must be constrained through measures of social justice and ecological prudence, and of such laws and regulations we certainly need more rather than fewer. Globalization will at length feed, clothe, shelter, and nurse the great majority of people on earth. But it is now being pushed thoughtlessly and heedlessly by and large, and it remains for the most part untouched by the wisdom of Ernst Schumacher of thirty years ago (Schumacher 1973).

One development that has beneficially constrained and reformed capitalism is what Andrew Feenberg calls secondary instrumentation. It is the appropriation of a certain technology by ordinary citizens, often against the intention (the primary instrumentation) of the designers. Secondary instrumentation enlarges people's scope of discretion and competence, and it has in inconspicuous but significant ways made the industrial democracies socially more just and environmentally more benign. Hans Achterhuis mentions Feenberg's discovery as the outstanding example of the kind of empiricism that is needed in the philosophy of technology.

I entirely share Achterhuis's high regard of Feenberg's most recent work.[6] The theory of secondary instrumentation has uncovered a remarkable phenomenon that gives us some reason for hope about the fate of the technological society. I also agree with Achterhuis about the general importance of empiricism in the philosophy of technology. Only by asking how our reflections comply or contrast with concrete reality can we hope to make philosophy a serious and influential enterprise. There is, however, little to fall back on by way of example or instruction when it comes to empiricism in philosophy, and so it is hardly surprising that when philosophers take the empirical turn, the vehicles of argument at times begin to slide and end in a ditch.

To avoid calamities, we need to distinguish three different kinds of empirical approaches. The first is the phenomenological, rightly championed by Peter-Paul Verbeek. It is Husserl's original move "to the things themselves," the resolve to look and see what is in fact the case. Verbeek is right also in defining "phenomenology rather broadly" and using it in an eidetic (though not essentialist) way. The second may be called Veblen's approach who characterized it thus:

> ...the data employed to illustrate or enforce the argument have by preference been drawn from everyday life, by direct observation or through common notoriety, rather than from more recondite sources at a farther remove. It is hoped that no one will find his sense of literary or scientific fitness offended by this recourse to homely facts...(Veblen 1992, pg. xx)

Finally there is the social science approach that supports an argument through empirical data that meet standards of validity and reliability. Failure to make these distinctions invites confusion and error, and so does the closely related failure to make clear whether a proposition is intended to have merely descriptive or also normative force.

Verbeek finds an alienation thesis in *Technology and the Character of Contemporary Life (*henceforth *Technology*) and goes on to say that the thesis "makes an empirical claim that is at odds with empirical reality." To support his criticism he furnishes evidence of the phenomenological kind, sketches of situations where devices of engagement come into their own. He puts his point most generally as follows:

> On the basis of this basic phenomenological framework, Borgmann's theory of the device paradigm can be reformulated. This reformulation allows one to analyze the role of technological devices in people's relationship with their world in terms of mediation rather than alienation. (21)

I agree entirely. In *Technology*, I call devices of engagement *instruments* and say: "But technology can produce instruments as well as devices, objects that call forth engagement and allow for a more skilled and intimate contact with the world," (*Technology*, p. 221). I clarify the point in a note that says:

> How can there be technological engagement if technology is defined as disengaging? The answer is that technology in this essay is defined according to the device paradigm, and so defined it becomes disengaging primarily (a) in consumption and (b) in the mature phase after it has taken the ironical turn. Hence the possibility of technological engagement suggests that technology could achieve an alternative maturity.

There is already technological engagement in the sense that certain activities essentially depend on technological products as alpine skiing or bicycle racing do. But note that the technological devices do not procure but mediate engagement. The engagement is finally with slopes, snow conditions, courses, turns, etc. And there is full and skilled bodily engagement too, (*Technology*, p. 288, n. 12).

In his critique of technological information in *Holding*, Verbeek correctly stresses my apprehension that such information will displace actual reality. But technological information *can* be, and significantly and uniquely *is*, *about* reality as well. In *Holding* the point is made as follows (p. 216):

> We are still learning to see the world in light of technological information, and as we do, expanses formerly too broad, structures once too fuzzy, matters at one time too dense are all becoming clear and bright. For humans who "by nature desire to know," this is a wonderful gain.

In *Technology* (p. 246) I say of older information technology: "Media technology allows us to consider all things and to be enlightened about the world in an intelligent and compassionate way."

So are there no disagreements between Verbeek and myself? Verbeek is right on one point, and he has left another unresolved. Assume a visitor from Holland is critical of the contribution the United States makes to foreign aid. In reply I tell him in detail about three of my acquaintances who write regular and substantial checks to Oxfam. Our visitor doubts my account. I prevail on my friends to send him copies of their canceled checks to Oxfam over the last two years. Should he now concede my point?

The right answer turns on a distinction between descriptive and normative discourse. The issue the visitor from the Netherlands raises is a moral one, a charge, justified in fact, of a global injustice or at least of a lack of charity (Shah 2002). My reply (the analogue of phenomenological evidence) is descriptively unimpeachable, but morally inconclusive at best and misleading at worst. The same holds for phenomenological evidence. To return to information technology, Verbeek says I fail to see that the role information technology actually plays in our culture, does not consist in offering a *substitute* for reality, but in *mediating* our involvement with reality and with each other. And instead of estranging people form each other; many information technologies rather enhance their contact.

Who is "the we" in "our involvement"? Verbeek and his colleagues? Who are the "people" that are not being estranged "from each other"? Verbeek's friends? His students? If the answer is yes, we should remember what social scientists tell their students: The plural of "anecdote" is not "data." The significance of "devices of engagement" depends on the extent to which devices are in fact used in an engaging or disengaging way. As far as information technology is concerned, it is too early to tell how it will typically be integrated into working time and free time. But at least as far as the United States is concerned, social science evidence is accumulating, and on the whole it is not encouraging.[7]

What then is the status of phenomenological evidence? First, it opens up avenues of exploration. It can yield the hunches that are crucial to gaining insight in the philosophy of society and culture. It begins to firm up our intuitions and enables us to ask significant questions of empirical reality. Second, it can be used normatively to describe a model of how a particular technology or even all of technology is to be used responsibly and in support of the pursuit of excellence. Finally, and in conjunction with social science data, it can be used to criticize and indict certain social practices or even the character of a particular culture. Verbeek does fine work of the first kind, and his work could well be read in the normative sense of phenomenological evidence. But the relation of his phenomenology to what he calls "empirical reality" is ambiguous at best.

Achterhuis, in at least some places, is entirely unambiguous as far as empirical reality is concerned. It is the empirical reality of social science data, and he takes such data to be decisive. He rightly condemns the classical critiques of technology for their failure to address "concrete technological practices and developments" and "to appreciate how these can rapidly alter the actual normative framework of culture." He is right on target in saying that it is no good when one of the classical critics of technology tries to substantiate a claim by quoting another classical critic. "The only way out of this predicament," Achterhuis continues, "lies in social research concerned with the way people are experiencing our technological culture."

What I find especially congenial in Achterhuis's conception of the philosophy of technology is his insistence that in the pursuit of empirical reality we should not give up the "normative inspiration" of the classical authors. At the same time, Achterhuis realizes that breaking with the classical tradition "is difficult and arduous." His essay illustrates the problem. It only refers to the texts of philosophers and classical critics.

The problem becomes acute in the discussion of the connection between the device paradigm and professed happiness. In an earlier reply to critics I said that the empirical evidence did not support the proposition that happiness declines as the standard of living rises.[8] Hence Achterhuis concludes: "Borgmann's central argument turns about the deceptive quality of the promise of technology to procure happiness. If this promise is simply realized, the whole structure of this argument should fall down."

I should first point out that my critique of the technological society consistently turns on two issues as the title of the chapter Achterhuis discusses indicates: "Leisure, Excellence, and Happiness." The state of a society's excellence has an empirical side to it as well, and Achterhuis does not take issue with it. Thus I am not sure the whole structure of my argument should fall down, but it would certainly suffer significant damage if it turned out that technological progress led to a rise of professed happiness. But as I pointed out in the earlier reply, it remained that technological advancement leads to a diminishing and eventually to no positive return in happiness.[9] This is remarkable enough, and it has recently been confirmed and underscored (Frank 2000; Frey and Stutzer 2001). But there is other and more recent evidence that supports the stronger claim in

Technology — that we may face, as the title of one book has it, *The Loss of Happiness in Market Democracies* (Lane 2000; Myers 2000).

Achterhuis similarly takes exception to my claim that watching television leaves viewers unhappy. Achterhuis puts his criticism this way:

> According to him, television suffocates conversation, reduces common meals, supersedes reading, crowds out games, walks, and social occasions. This may be true, but these are clearly not the criteria that people use themselves when watching television. Their professed feelings don't count for Borgmann.

What then are their professed feelings? Achterhuis does not tell us. I cited some evidence in Technology that supported the claim of people's misgivings about their television watching (and also note one apparent piece of disconfirming evidence: notes 68 and 69 on p. 277). Meanwhile stronger evidence for still deeper misgivings and for the depressing effect of watching has been gathered (Kubey and Csikszentmihalyi 1990; Robinson and Godbey 1997, pg. 136-53). "So the only way out," Achterhuis continues, "is to liken the attractiveness that television possesses to addictiveness." "Television Addiction Is No Mere Metaphor," is the title of a recent article in *Scientific American* that also cites evidence confirming my conjecture (*Technology,* p.142) that "[t]here may be physiological components to its addictiveness" (Kubey and Csikszentmihalyi 2002, pg. 74-80). Achterhuis, of course, could not have known this article, but the landmark study on *Television and the Quality of Life* has been available since 1990.

Integrating empirical data into philosophy is hard and challenging for more reasons than one. The first challenge is simply achieving familiarity with the data that are out there and then keeping up with the changes that one has to expect. It is in the very nature of empirical data that they are revisable, either because research methods have been improved or because the phenomena, reflected in the data, have changed. The second challenge lies in the complexity of data. The pitfalls for the validity and reliability of data are legend and legion. The problem for philosophers is aggravated by the fact that social scientists rarely ask the questions that we would like them to pose. Hence we must often work by approximation and triangulation. Finally, philosophical practice has given us a misleading model of counterevidence. In contemporary analytic philosophy at least, claims are meant to carry nearly necessary and universal force. Hence the cult of the counter-example. A good counterexample or two can bring down an entire structure. When Edmund Gettier gave counterexamples to the conventional view that belief, truth, and justification are necessary and sufficient conditions of knowledge, a flood of responses, designed to repair the damage, was loosed. Verbeek and Achterhuis seem to have been influenced by this practice. A few cases of engaging devices or one kind of empirical evidence they think to be decisive. In the analytic tradition, a philosophical claim is like a balloon. One good pinprick is enough to deflate it. Issues in social and cultural philosophy are more like logs. It takes a few wedges and some application to cleave them apart.

Though Achterhuis thinks that empirical data or the lack of them can be devastating, he does not finally think of them as central. He champions the kind of empiricism we find in Feenberg's *Questioning Technology* which is chiefly of the Veblen type. Feenberg's evidence is not so much based on social scientific research as it is "drawn from everyday life, by direct observation or through common notoriety." Of course, he also refers to extraordinary events and reminds us of facts that are slipping from common memory. In all of these ways, he has made his impressive case for secondary instrumentation. Yet Feenberg is clear on how far common creative appropriation of technology has taken us. He says of instances of secondary instrumentation: "We need a method that can appreciate these occasions, even if they are few and far between, even if we cannot predict their ultimate success." He takes anything but a rosy view of where we have taken technology so far and speaks of "the debasement of mass culture," (Feenberg 1999, pg. 11) "the mediocrity to which [modern society's] knowledge, wealth, and creativity is put," (26) and the need "for the transformation of daily life and culture" (28).

Achterhuis toward to the end of his essay suggests that secondary instrumentation and focal activities can be connected. He reminds us that the ingredients of a "highly enjoyable feast" can all be products of the technological culture, and he concludes:

> When one changes the spectacles that Borgmann wants his readers to wear, one sees technically mediated activities and products that just were impossible to realise in a traditional culture. The same goes for hiking and running. Both presuppose a modern technological infrastructure, both are making use of many kinds of high-technological devices. Both can better be understood as the appropriation of technology on the second level of instrumentalization than as a focal protest against the first level that Borgmann is describing as the device paradigm.

I can only agree with Achterhuis's substantive point, and I have done so in *Technology* where I acknowledge the contribution technology has made to running: "Runners appreciate shoes that are light, firm, and shock absorbing. This allows one to move faster, farther, and more fluidly" (p. 221). About hiking in the wilderness I say: "But what really keeps us warm and nourished in the wilderness of nature are the blessings of technology, hiking boots, backpacks, tents, stoves, freeze-dried foods, and all the other compact, lightweight, and efficient devices that we carry into the wilderness" (p. 193).

A crucial proviso, however, follows both of these cases. Devices of engagement, to use Verbeek's helpful term, must serve the engagement and disclosure of reality. Verbeek is clear on that crucial point, and Achterhuis at least implies it. It is an empirical question in all three of its versions whether, all things considered, technological devices or more traditional things (almost all of which have some technological components today) are more congenial to focal concerns.

It is a normative question whether technological societies are conducive to the good life, and this is a concern the contributors to this little symposium have in common. That shared concern testifies to a remarkable affinity — the public and philosophical conversations, at least in this country, are largely oblivious to that crucial issue. Answering the question requires collaboration and a division of labor. It has become clear that in the interstices and beyond the margins of *Holding* and *Technology* much remains to be elaborated, added, explored, and settled. I am grateful to my readers for having pointed this out. My hope is that this conversation will make some small contribution to the vital task we all are engaged in.

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End Notes

1. Aristotle, *On Interpretation*, 16a, 4-8.

2. Gordon Brittan, *Kant's Theory of Science* (Princeton: Princeton University Press, 1978) and "Kant, Closure, and Causality," in *Kant on Causality, Freedom, and Objectivity*, ed. William A. Harper and Ralf Meerbote (Minneapolis: University of Minnesota Press, 1984), pp. 66-82 among many other publications.

3. In an unpublished paper titled "Broken Symmetries: Cosmology and Ecology."

4. See my "Contingency and Grace in an Age of Science and Technology," *Theology Today* 59 (2002), pp. 6-20.

5. See my "The Development of Technology in Eastern and Western Europe," *Europe, America, and Technology*, ed. Paul Durbin (Dordrecht: Kluwer, 1991), pp. 1-11.

6. See my "Democratic Technology: On Feenberg's *Questioning Technology*," forthcoming in *Research in Philosophy and Technology*.

7. Robert Kraut et al., "Internet Paradox: A Social Technology that Reduces Social Involvement?" Available 31 August 1998 at <http://homenet.hcii.cs.lmu.edu/progress/HN.impact.10htm>. This report was severely criticized on methodological grounds. See Denise Caruso, "Critics are Picking Apart a Professor's Study that Linked Internet Use to Loneliness and Depression," *New York Times*, 14 September 1998, p. C4. Norman H. Nie and Lutz Ebring, "Internet and Society: A Preliminary Report," available on the Web 17 February 2000 at <stanford.edu/group/sigss/>. Nie was quoted in John Marko, "Portrait of a Newer, Lonelier Crowd is Captured in an Internet Survey" in the New York Times on the Web, 16 February 2000, as saying that "the more hours people use the Internet, the less time they spend with real human beings," Langdon Winner, "Enthusiasm and Concern: Results of a New Technology Poll," available on the Web 29 February 2000 at <oreilly.com/people/staff/stevet/netfuture/2000/current/html>. Winner reports: "But the findings about computers and the better life come with a stunning paradox. Of those who have computers at home 57% report they now spend less time with families and friends." Deborah Mendenhall, "Web Doesn't Promote Isolation, Study Says: Results Contradict Earlier Poll," available 22 August 2001 on the Web at <sfgate.wm/cgi-

bin/article.cgi?file'/c/a/2001/08/22/BU98992.DTL>. This study is by Kraut whose methodology had been condemned. John B. Horrigan and Lee Rainie, "Getting Serious Online," available on the Web 3 March 2002 at <pewinternet.org>. This is a comparison of responses in March 2001 with responses from March 2000 and finds no significant change in the balance between Internet use and actual contact with family and friends. See also *Communities in Cyberspace*, ed. Mark A. Smith and Peter Kollock (London: Routledge, 1999).

8. See my "Reply to My Critics," in *Technology and the Good Life?* Ed. Eric Higgs, Andrew Light, and David Strong (Chicago: University of Chicago Press, 2000), p. 357.

9. "Reply to My Critics," p. 358.