Revisiting *Philosophical Tools for Technological Culture*

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I am pleased and honored that six well-read, insightful, and industrious colleagues have taken the time to respond to the successes (and shortcomings) of my book *Philosophical Tools for Technological Culture* (PTTC). I have learned from each of them over the years. Since each of their contributions is rich in detail, and since my space is limited, I will be able to respond only to what I take to be their main points.

Joanne Baldine

It is apparent from her comments that Joanne Baldine has read both PTTC and its predecessor, *John Dewey's Pragmatic Technology*, with great care. She identifies and illuminates their major themes with almost laser-like accuracy. She notes my concern that technology needs to be restored to its proper place as a type of inquiry that is both temporally and ontologically prior to what are commonly called the theoretical sciences, and she marks with approval my attempt to put to rest the "autonomous technology," "technology-as-ideology," and "technology as domination" strands in European thought. She thinks, as Dewey did and I do, that philosophers and non-philosophers alike need to turn their attention to the task of clearing out the metaphysical and epistemological debris that litters our cultural landscape. She also agrees that technology as the "logos" of "techne" is one of the best tools that we have for tuning up our tools and techniques in ways that will allow us to deal with our cultural detritus.

Given her broad understanding of our technological culture, I am pleased that she has found so little to criticize in PTTC. She does register several objections, however, and they are significant. One concerns my lament that when John Rawls developed his idea of the "original position" he did not seem to take account of the fact that human beings are situated very differently with respect to the tools and techniques at their disposal. Baldine wonders how Rawls' attention to this matter might have altered the contract, since he "leaves it up to each person to figure out what kind of arrangement would be optimum." What I was suggesting in my brief, almost passing remark about Rawls was that he seems to ignore conditions that render this type of rational approach unlikely or impossible. It just seems obvious that some individuals are so far impoverished

in a technical and instrumental sense that they would be unable to render an informed decision about an original social contract, even a highly theoretical one.

Although it is not an objection as such, she notes that since the publication of *John Dewey's Pragmatic Technology* I have changed my view regarding whether the Aristotelian hierarchy of theory, practice, and production should be simply inverted. This is a very important point. Since I published that book I have come to think that Dewey's productive pragmatism gives pride of place neither to theory nor to practice, but treats both as phases or moments within sequences of inquiry, or to use a different metaphor, as "business partners" engaged in the production of new inquirential outcomes.

Near the end of her remarks she suggests that my arguments regarding a "naturalized" technology are not as clear as they might have been. After having re-read them several times, I must concede the point. She wonders whether I am claiming that "technology might be construed as the next step beyond evolutionary biology."

If the term "technology" is accepted in the manner I have suggested, however, and if "evolutionary biology" is understood as the evolution of purely organic structures and functions, then I would argue that this has already happened. A part of my motive for discussing a "naturalized technology" was to remind my readers of the obvious (but oft-forgotten) fact that tools and techniques entered into and began to influence the evolution of human beings at a very early stage of our development. By developing the idea of a "naturalized technology" I wanted to emphasize several points. First, we would be well served to put behind us once and for all time the old "technology-as-something-over-against-human-life" strands in European philosophy from the 1920s to the 1960s and beyond. Second, if we look backward in evolutionary time to the point at which tools and techniques began to influence human evolution, we find a continuity there between the organic and the artifactual. It was Marshall McLuhan, I believe, who suggested that "we shape our tools and thereafter our tools shape us." And third, a naturalized technology points the way forward to a human future in which technology as method of inquiry, as opposed to any particular set of tools or techniques, can and should continue to be an important factor in the further evolution of the human species.

Finally, Baldine suggests that it is time to dump once and for all the old-fashioned block notions of technological determinism and think instead of new

kinds of technological determinism that are dynamic and that connect "what we know and how we might practically act to tune up, adjust, or change technological culture." In short, she wants to substitute a "retail" determinism for the old "wholesale" models.

Point taken. I take it as true that the world of our experience, with its hard realities, its vectors, and its various types of momentum exhibits this "downsized" type of determinism. Artifacts have unintended consequences, and bad choices are sometimes difficult or even impossible to correct. Baldine's very helpful suggestion, as I understand it, is that we take more account of what it is possible to achieve and spend less time theorizing about what might be the case in some possible world, whether utopian or dystopian. I could not agree more. At the same time, however, I think that this newer, more flexible determinism might be tempered even further. Our tools and techniques have historically tended to be multivalent beyond our expectations, and even to offer unanticipated opportunities for amelioration. There is no reason to think that this situation has changed.

Albert Borgmann

I have long admired Albert Borgmann for the care and precision that he brings to his craft. It is no accident that his books and essays have come to occupy a central place in the canon of our discipline. No one who wishes to understand our technological culture can afford to ignore his acute analyses of the deforming tendencies of contemporary media, or his insights into the ways in which the celebratory moments of life can be enhanced.

Borgmann is, of course, correct when he points out that Dewey did not concentrate his critique of technology in any single one of his many books. Compared to the sharply focused treatment one finds in Heidegger's two seminal postwar essays on the subject, for example, Dewey's contributions to the philosophy of technology are a part of the complex web of his contributions to logic, philosophy of education, psychology, aesthetics, and naturalistic metaphysics. To put matters somewhat differently, the fact that he was able so successfully to integrate his critique of technology within his wider philosophy may not, at least in the short term, have worked to his advantage.

Borgmann is also correct when he describes Dewey as a liberal. His preferred modifier "mainstream," however, may not be entirely appropriate. Alan Ryan

has argued that Dewey was a guild socialist in the style of G. D. H. Cole in Britain, but my own sense is that he was a Social Democrat similar to the type that Willy Brandt in Germany would become a few years later. Dewey voted for the Socialist Party more than once, and he criticized Franklin Roosevelt's New Deal from the left.

Beyond that, however, I get the sense that Borgmann thinks that Dewey needs to be rescued from my tendency to "flatten" his discussion of technology by over-refining and over-working it, rather like bread dough that has been too thoroughly kneaded and has failed to rise, becoming impenetrable in the baking. He thinks Dewey's treatment of the subject is more elevated and, well, fresher and more resilient than I have been able to grasp (or at least portray), and certainly more like Langdon Winner's conception of technology as a form of life. As a consequence, he suggests, my brand of pragmatism has been "fortified" by a kind of thick crust that appears impenetrable to criticism.

Whether they be criticisms or no, Borgmann does register several concerns. For one thing, he thinks that my definition of technology is "weak…as regards norms for reform." He is concerned that I (and perhaps Dewey as well) reject "firm norms." This, he argues, cannot be right. "In fact, absent firm values or norms, there is no guidance at all." In his view, "if values are testable, then there must be strategic or higher-order values that are firm and tell us whether our tactical or first-order values that are being tested at the moment will serve as effective means for the strategic ends."

These comments are yet a further installment of what I regard as a highly productive discussion about norms that Borgmann and I have had over several years and in several venues. In this current episode he seems to want to drive a wedge between what he takes to be Dewey's "flexibility" as "reasonable or at least acceptable," and what he terms my "radicalization of the issue" that achieves "clarity at the cost of normative aimlessness."

On this issue, however, I think that we may be closer to agreement than he realizes or is willing to admit. He briefly mentions the view of Charles Taylor, who thinks that "norms grow out of particular historical situations and yet have a rightful claim on our allegiance." In general terms, this is also the view that I find in Dewey, and which I myself hold.

Borgmann and I do seem to differ, however, when it comes to the details. He is correct when he says that I emphasize an open-ended experimental approach to norms, an approach that encourages the emergence of new norms that can replace older ones. His more conservative approach tends to emphasize norms that are time-honored, and he seems less inclined to engage possibilities that might lead to their reconstruction or replacement. Whereas he is interested in honoring what he terms ultimate concerns, I am concerned that what may be of ultimate concern for some may not even be acceptable for others. Perhaps it is just that my own commitment to fallibilism reaches a bit deeper than his own. Of course he may want to say that I have just reached for a meta-norm such as pluralism or fallibilism that I treat as ultimate. To this I would reply that pluralism and fallibilism, along with democracy, growth, and a host of other such terms, are more or less vague tools, or ends-in-view. They become determinate only in the course of the type of experimental work that is required when there are hard decisions to be made.

Borgmann is also concerned that there is little historical sensitivity in my pragmatism. He thinks that I have been guilty of impiety with respect to the contributions of "major twentieth century and contemporary philosophies," making them pass in review before being sent off to be condemned. This, he suggests, renders my position insufficiently pragmatic.

I hope I can dispel the idea that the material he mentions, which appears in the last chapter of PTTC, was somehow intended to dismiss the work of the philosophers I discussed there. Each of the philosophers I discussed has made a unique and irreplaceable contribution to our understanding of human life. My point was rather to express surprise that so many of Dewey's contemporaries—philosophers who had so *much* that was important to say about *so many* important matters—had so *little* to say about technology when compared to the attention that Dewey himself lavished on the subject.

There was also a second point that I had hoped would be clear in that chapter. Dewey offered an account of technology that was a part of a comprehensive philosophical program, one that included ethics, aesthetics, logic, philosophy of education, philosophical anthropology, and even philosophy of religion. I simply have not encountered another philosopher who has situated his or her account of technology within such a broad reach of philosophical investigations.

Paul Durbin

Paul Durbin correctly observes that there is not much in my book about environmentalism. I freely admit that he is correct. As he also notes, however, I have addressed some of the issues he raises in essays published elsewhere. He mentions two of my essays that are devoted to a discussion of what Dewey has to offer to contemporary debates in environmental philosophy.

Durbin might have also said the same thing about my relative silence in this volume about race, gender, and class issues. In another essay, however, which lived its life backward (having first been published as a book chapter and then reprinted in a journal) I argued in defense of legalized marriage for gays and lesbians. I cheerfully admit that there are many issues that this book is not about, and these are among them. I have, however, discussed some of these important issues in other venues.

More to the point of Durbin's comments, however, I would like to suggest that the project of divesting ourselves of old intellectual habits and the projects of progressive activism are not as much at odds as he supposes. They can in fact complement one another. There are several arguments that can be advanced in support of this thesis, and they are addressed either explicitly or implicitly in my book.

First, and perhaps most importantly, most philosophers are also teachers. A part of our job as teachers is to help our students do just what Dewey called for in the passage that Durbin cites: to recognize and criticize old tools that no longer function properly and to reconstruct them in ways that make them more useful.

Most of our students are concerned at some level or another about the future of the environment. Some of them will become active participants in environmental organizations. Some of them will become the managers of corporations that make economic choices that impact the environment. And we can at least hope that most of our students will be regular voters. As teachers, we are activists by definition. This does not mean that we should be committed to one or another of the many available pre-packaged ideologies. Good teachers continue to examine their own prejudices with a view to creative interaction with their students.

Second, philosophers are increasingly called upon to serve in the role of what in the current climate passes for the public intellectual. Perhaps we do not always

recognize this role as such because of the effects of disciplinary splintering that has occurred. But philosophers now sit on boards of hospitals, on laboratory animal care review boards, and on an increasing number of advisory boards of various sorts, including those that deal even more directly with environmental issues. It is in these venues that intellectual divestment and social activism are already interacting to produce new and better social products.

Third, there is the matter of the relation of theory to practice. This is an issue that I address directly in chapter nine of PTTC. I tell a story in which, together, "theory and practice engage in a conversation that constantly adjusts means to ends-in-view, and ends-in-view to the means at hand. The goal of the partnership is not merely action, but production. The goal of the partnership is continual adjustment to changing situations by means of the development of enhanced tools and new products" (PTTC, 180). Activism without a theoretical component is, in my view, no more desirable than theory that has no issue.

Durbin is concerned that I may be somewhat insouciant regarding the ideal balance between intellectual discussion and activism. He reports that when he asked me during an APA author-meets-critics panel about the proper way to balance these interests, I replied "That's a matter of personal preference." But Durbin now writes that he does not want a "balance" between the philosophical work of divesting ourselves of old intellectual habits, on the one side, and getting involved with others in political activism, on the other. He thinks philosophy should *always* have an activist component, or at least an activist aim.

It would be foolhardy, of course, to argue that 20th century mainstream philosophy achieved even modest success when it came to engaging real-life issues. As I indicated in PTTC, however, I believe that situation has now changed for the better. It was in this connection that I mentioned the work of Paul Thompson in the field of agricultural ethics, and others as well whose work exemplifies how philosophy can be relevant in the spaces where technoscience meets industry and commerce. Paul Durbin's own work in the field of environmental studies is another example of this trend.

When I offered the reply that Durbin finds inadequate, namely that finding a balance between philosophical writing and discussion on the one side and on-the-barricades activism on the other was a matter of personal preference, I was not just dismissing his concern. I had several considerations in mind.

First, following Dewey, I assume that all philosophical writing and discussion that merits the description "intellectual divestment" arises from our lived, embodied experiences and returns there for its tests and confirmation. Putatively philosophical writing and discussion that fails to do this tends either to empty formalism on one side or pointless narrative on the other. Second, "intellectual divestment" is not simply a form of personal therapy: it is a form of public activism. This is especially the case when philosophers do their work in the classroom and as members of academic communities. Third, to elaborate on a point I have already made, activism in the classroom has a multiplier effect that can often reach further than activism elsewhere. (A decade or two of teaching classes in which the problems of global warming or sustainable agriculture are critically discussed, for example, can influence thousands of future decision-makers.) And fourth, whether or not we like to admit it, each of us has a limited amount of time and energy. Real-life situations require that we make judgments about competing claims. Most of us are called upon daily to choose between various ends-in-view that may be equally desirable but which are mutually exclusive.

In short, although I take Durbin's claim seriously, namely that philosophers should be activists, I think that he and I may differ on the subject of what constitutes activism.

Andrew Feenberg

Apart from self-described pragmatists such as Paul Durbin and Paul Thompson, I believe that Andrew Feenberg has come the closest to taking the route that Dewey wanted the philosophy of technology to take. Ironically, however, Feenberg appears to be far from comfortable with this assessment.

He admits that over the years he has moved away from the "logic of dystopia" articulated by his teachers toward a more constructivist view of technical life and culture. And he admits (even though, it seems, somewhat grudgingly) that Dewey could be said to have anticipated constructivism. (Dewey, of course, did not "anticipate" constructivism. Along with his colleague George Herbert Mead, he *was* a constructivist.) But this is about as far as Feenberg seems to wants to go down a pragmatic path.

Feenberg splits his criticism of PTTC into two parts: his critique of Dewey and his critique of my own proposals (primarily my assessment of his project). As to

the first, he thinks that even though Stanley Cavell may have gone too far in his characterization of Dewey as an Enlightenment optimist, his (Dewey's) rhetoric nevertheless suggests a "narrowly manipulative and intellectualist attitude." Just to make sure that we have not missed his point, he rehearses it several times during the course of his comments. He writes that Dewey was "excessively friendly to Enlightenment rationalism." He charges that Dewey's admiration for science and technology "overtakes his critical faculties." These indictments, of course, reiterate the standard caricature of Dewey's views. They are close paraphrases of the charges directed against Dewey by first generation critical theorists.

As to the second part of his response, Feenberg thinks that I have somehow hijacked the term "technology" by defining it much too broadly. It is in this vein that he objects to my suggestion that the work of novelists involves problem-solving. His comment, however, "But surely literature articulates meanings found in experience rather than solving problems," has an interesting rhetorical effect. His use of "literature" rather than "the novelist" or "the writer," as the subject of his sentence invites us to think of literature as something whose origins are indeterminate, that literature somehow articulates itself independent of the writer's *craft*.

Since Feenberg is himself the author of a good-sized shelf of books, he should know better. To write is to solve problems of voice, tone, structure, texture, cadence, word choice, and a thousand things more. Anyone who has written the briefest of essays, or even a letter of more than a page or two, knows this.

In this same vein, I am hard put to understand why Feenberg does not want to admit the artifactual status of "meanings and significance." In the United States alone, the production of "meanings and significance" is a multi-billion dollar a year industry. In one of its versions, this is the very idea that worked so very well for the first generation critical theorists Horkheimer and Adorno: they attacked the American culture industry's manufacture of meanings as a part of their version of technological dystopianism.

As a part of his discussion of technology and democracy, Feenberg recalls the "experts" of the 1960s who "gave science a bad name by aping its methods for inhuman ends, for example, the so-called 'pragmatic' intellectuals behind the Vietnam War." A full response to Feenberg's remarks on this subject would

require considerably more space than I have at my disposal in this essay. Nevertheless, I would like to make the following points.

First, I did in fact spend a considerable portion of chapter seven of PTTC discussing the very 1960s "experts" that Feenberg mentions. It was in this vein that I reviewed and criticized the work of the philosopher Emmanuel Mesthene ("Technological Change: Its Impact on Man and Society") and the sociologist John McDermott ("Technology, the Opiate of the People").

Second, Feenberg may have said more than he intended when he judged that the "experts" were "aping" scientific methods. Of course they were. What they were doing was bad technoscience. Their error, however, was the reverse of the one usually targeted and discussed by the critical theorists, namely the domination of means by ends. The mistake of the "experts" of the Vietnam era was that they allowed their ends to be dominated by their means. They thought that their tools and techniques were so effective that they could just allow their ends to remain vague. (Their ends were not flexible. Flexible is good. Their ends were vague: they were never sharply defined.) They assumed that a clear end-in-view would somehow emerge from the continued use of means-at-hand. As a part of my discussion in chapter seven I suggested some of the reasons why the methods of these "experts" were not among those "that have proven successful in the technoscientific disciplines."

Third, of course, even though Feenberg identifies those "experts" as "pragmatists" I hope it is clear that the term applies to them only in the most vulgar of senses. In all this Feenberg appears to retreat from the constructivist position that he developed in *Questioning Technology* and in the first few paragraphs of his response to PTTC. "There is something in the very structure of our scientific-technical rationality," he writes, "that needs reforming to anchor it firmly in humane pursuits." This sentence expresses a generic, textbook dystopianism that could have been written by Herbert Marcuse, but that I had understood Feenberg to have abandoned.

Finally, Feenberg says that he has reconstructed the dystopian critique of technology *inside* the constructivist approach. He cites this as one of the features of his work that he does not share with Dewey. But if what he means by "dystopian" and "inside" in this context is that a hard, unflinching, critical analysis of cultural tools and techniques is an essential component of any process of social inquiry that attempts to resolve perceived difficulties in a democratic

fashion, then this is precisely Dewey's position. Despite disclaimers, then, and even the odd moment of rhetorical backsliding, I'm happy to stick to my original claim: Feenberg's current take on technology is closer to Dewey's than it is to his teacher Marcuse, and it is certainly closer to Dewey's than he is willing to admit. I, for one, think that his pragmatic turn is a good thing and I hope that he will continue to travel that road.

Robert Innis

Robert Innis is a careful reader of the American pragmatists, and much else as well. I am therefore grateful for his insightful comments.

Like Durbin, Innis has been nice enough to note some of the many issues that are not discussed in my book, and he has expressed regret that they are not there. He would, for example, like to see a nice, neat taxonomy of tools, techniques, and artifacts. So would I. It would be a pleasure to join with him in developing one. Perhaps one day we can do that.

Innis asks, and he is correct to do so, what we gain by treating technology as inquiry. Of course there is the obvious answer that we gain a kind of etymological justification. If biology is the study of bios, or life, and if geology is the study of geos, or the earth's structure and materials, then what of techn-ology. Must that not be the study of our tools and techniques? Beyond that, however, there are other considerations as well.

First, we can provide grounds for rejecting the long tradition that treats technology as an autonomous thing with an essence. Jacques Ellul, perhaps most notably, championed this view, and the early critical theorists said more or less the same thing. There is even a penumbra of this view in the work of Jürgen Habermas. As I've already indicated, I'm happy to report that Andrew Feenberg, who is a student of Marcuse and who himself has excellent credentials as a critical theorist, began his latest book, *Questioning Technology*, with the manifesto that the time has come for a non-essentialist account of technology. I have argued that Dewey developed just such a program about a century ago.

Second, by treating technology as inquiry we are reminded that technology is a natural human activity, and not something foreign to human nature. Technology is placed in the context of the history of the evolution of inquiry and tool-use that predates even *homo sapiens*. This is a powerful antidote to the claim that

technology is somehow alien to what is human. It is also a powerful antidote to platonism, philosophical and religious, which treats tools as having been formed some place outside of experience, be that heaven Platonic, Christian, or Fregean.

Third, by treating technology as inquiry we can begin to undermine the split between the arts/humanities, on the one side, and the technosciences, on the other, that has infected the thinking of the early critical theorists, Martin Heidegger, Habermas, and others as well. Even Heidegger's poets to some extent treat language as standing reserve, and even Habermas's emancipatory action involves the application of tools and techniques.

And fourth, by treating technology as inquiry we can develop new platforms for promoting technodiversity. When we are thinking in terms of technodiversity, we are thinking about how our tools work in inquiry, and not about their pedigree.

Innis insists that technology as I have characterized it is a part of the "whole lived field of experience." It is an aspect of our situated, *medias res* lives. Unlike Feenberg, consequently, he has no quarrel with my claim that meanings and significances are artifacts produced in the act of living. He is also sensitive to the aesthetic dimensions of the technical and technological lifeworld. He thinks that "new ways of feeling and seeing emerge from tacit, acritical acts of integration of subsidiaries into wholes, from our embodiment in a vast field of differentiated artifacts with their own distinctive 'qualities.'"

Quite so. But I would add that *emergence* of new ways of feeling and seeing is one thing, and that the *securing* of those new ways of feeling and seeing is quite another. To put the matter in the language of Charles Peirce, the former is qualitative, in the sense of Firstness, whereas the latter involves meaning, in the sense of Thirdness. I take it that this is the distinction that Innis intends when he distinguishes between feeling and seeing as impetus to inquiry, on the one side, and as outcome, on the other.

It may be that Innis gives Dewey less than his due when he suggests that he had no "explicit theory of embodiment—no Heidegger's hammer or Merleau-Ponty's feather…" In the sense in which Heidegger's discussion of hammers and Merleau-Ponty's of feathers are discussions of instrumental extensions of embodiment, however, Dewey did in fact have such a theory. Moreover, his theory pointed in two directions: he stressed the instrumental character of bodily

organs as well as the embodied character of instrumental artifacts. Here is Dewey in "Interest and Effort in Education."

The organs of the body—especially the hands—may be regarded as a kind of tools whose use is to be learned by trying and thinking. Tools may be regarded as a sort of extension of the bodily organs. But the growing use of the latter opens a new line of development so important in its consequences that it is worth while to give it distinctive recognition. It is the discovery and use of extra-organic tools which has made possible, both in the history of the race and of the individual, complicated activities of a long duration – that is, with results that are long postponed. And, as we have already seen, it is this prolongation and postponement which requires an increasing use of intelligence. The use of tools and appliances (in the broad sense) also demands a greater degree of technical skill than does mastery of the use of the natural organs—or rather, it involves the problem of a progressively more complicated use of the latter—and hence stimulates a new line of development (MW.7.188).

When it comes to Innis's treatment of norms, I might well have just pasted his remarks, unedited, into my response to Albert Borgmann. Innis understands that we cannot aim at norms directly. They emerge from our practices, and the ones that are most relevant to us as we live forward through time tend to function as ends-in-view that must be fleshed out gradually, with careful attention to detail, and with scant assurance concerning how things will turn out. Perhaps even more to the point, however, Innis has a rich sense of the role that our tools and other artifacts play in the determination of these norms, or ends-in-view.

Paul Thompson

Paul Thompson and I have been colleagues and conversation partners for many years, so I'm particularly pleased that he has taken the time from his busy schedule to respond to my book.

Thompson presents a story of philosophy caught in a kind of pincer movement between mindless scientism on the one side and a catatonic fatalism on the other. So far, so good. This is more or less one of the stories I attempted to tell in PTTC. There is another version of the story, and it is also one on which he and I agree: analytic philosophy on one side, and so-called postmodernism on the other have tended to crowd out the space in which a pragmatic technology might be able to do its work. We are also in general agreement about which philosophers

and sociologists have been able to expand that space in ways that have made it more productive.

Nevertheless, there are some issues on which we appear to have reached very different conclusions. For one thing, we differ about how to understand the plan and purpose of PTTC. Thompson thinks I want to build a shrine to an infallible Dewey, a Dewey who was always right about everything. For another, he thinks that I've gotten caught up in what he calls the "tarbaby" of attempting a definition of technology. He thinks that both of these moves are tragically un-pragmatic.

The notion that Dewey had the answer to every question is, of course, nonsense. Although I would have chosen a somewhat less violent metaphor, Thompson is in one important sense correct when he says that I just keep "hammering away," trying to drive home the thesis that Dewey's ideas are relevant to current debates in the philosophy of technology. But despite "hammering" on that thesis for more than a decade, and despite the solid pragmatism that permeates the work of Paul Thompson, Paul Durbin, Andrew Light, and a few others, Dewey remains the Rodney Dangerfield of the discipline. He gets so little respect that he is still widely regarded as fitting into one of the two categories Thompson also deplores—either as naive apologist for unfettered industrialism at one extreme (pace Andrew Feenberg) or as flaccid neo-pragmatic relativist (pace Albert Borgmann) at the other.

At the end of the day, it may just be that Thompson and I differ about what my book is about. As I envisioned it, PTTC is an attempt to make as strong a case as possible for the contemporary relevance of John Dewey's pragmatic technology. I didn't discuss any of the areas where I thought Dewey had gone wrong because I wanted to focus on the ways his work could be used to expand the pragmatic space that Thompson also wants to see enlarged. My book is about technology. It is not about Dewey's unfortunate ventures into anthropological research such as his "Polish question" debacle in Philadelphia. It is not about his failure to understand the political situation in China during his two years there. It is not about his tragic relationship with Randolph Bourne. It is not about any number of other endeavors in which he was not at his best. What is at issue is the relevance of his instrumentalism—what I've called his productive pragmatism—to contemporary social problems.

In this respect, Thompson thinks that I did not spend enough time considering how technology can be problematic. In other words, I did not spend enough time discussing how and why technology "bites back." Perhaps that is because I don't think our problems can be laid at the door of technology, but are due to a variety of factors, including (a) failure to apply technology to faulty tools and techniques, and (b) situations that are, at least for the present, intractable. Regarding those faulty tools and techniques, however, I did include several discussions of faulty tools and techniques and tools such as the current state of electronic journalism and so-called "technology transfer." I devoted an entire chapter to the pitfalls of the politics of expertise. I discussed the capture and dismantling of the Congressional Office of Technology Assessment by Newt Gingrich and his political operatives.

To put matters a bit differently, I believe that Thompson's criticism tends to overlook a distinction that I made early on in the book, and on which most of the rest of the book hangs. This is, of course, the distinction between tools and techniques, on one side, and technology on the other. No sensible person would deny that we have lots of faulty tools and techniques. From the early critical theorists, to the followers of Heidegger, to some of the remnants of the New Left, this thesis, as a general statement of mostly vague discontent, has been just about beat to death.

One of my targets was in fact the generic dystopianism with which many philosophers seem to have been so enamored. Another was the split that philosophers have tended to honor that puts the humanities, the arts, and values on one side of an ideological chasm and the technosciences and facts on the other side. A third target was the bogus distinction between thinking and productive living. But I did not deal with issues that specialists such as Paul Thompson, Andrew Light, and others take on, many of which, like global warming and environmental injustice, are in my view ticking time bombs.

In all this, however, I fail to see how the problem could be technology. Technology, as it has been characterized (or defined) in my book, is the best self-correcting set of methods for *evaluation* of tools and techniques that we have. This is mainly what I wanted to discuss, and therefore why this particular criticism of Thompson's indicates that I may not have made my case with sufficient clarity.

Speaking of definitions, Thompson's discussion of my "definition" of technology appears to acquiesce to the terms of ordinary language as if they were clear, precise, and in need of no further inquiry to effect clarification. He writes that "everybody knows what technology is." He also says that "no pragmatist needs to define technology."

What he views as part of the solution, however, I view as part of the problem. I argued that the fact that people don't tend to make the distinction between tools and techniques on the one side and technology as inquiry on the other sometimes gets us into serious difficulties. If we were to follow Thompson's advice on this point, and just take ordinary usage as definitive, we philosophers might still very likely be using the terms "mind" and "body" as they are used in popular parlance, having concluded that since "everyone knows" how they are used and what they mean, there is no further philosophical work to be done.

Remarkably, Thompson writes that "the demand for definitions is an unreasonable and even misleading demand, made to seem reasonable by the very logicist, rationalist and empiricist traditions in epistemology that pragmatism is intended to supplant." In other words, Thompson is accusing me of casting my lot with analytic philosophy. (As he well knows, of course, logicism is a specialized version of analytic philosophy that deals with the relationship of mathematics to logic. That topic was not broached in my book. I did, however, offer a critique of rationalist and empiricist philosophical traditions.)

What makes Thompson's statement so remarkable is that if it is true, then Dewey himself was no pragmatist. He thought definitions quite useful, as long as we avoid the kind of essentialism that has so often been used to prop them up. Take this passage, for example. "The value (validity) of any given analysis of any given conception (this analysis being the definition) is finally fixed by the power of the interrelated characters to institute a series of rigorous substitutions in discourse. Only such a conception of definition accounts for the indispensable role played by definitions in inquiry, and explains how and why a given selection and conjunction of the terms of a definition is logically grounded instead of being arbitrary" (LW.12.341-42).

Perhaps I have misunderstood Thompson on this point, however, since it seems hard to imagine that he would wish to privilege the loose, scrappy ways in which words are used in ordinary speech. Were this true, he would leave no room for

what Dewey called "analysis of any given conception" and the "indispensable role played by definitions in inquiry."

Thompson is also concerned that PTTC appears to argue that "technology is the answer to any problem." Such a position, he thinks, would be tautological. But if, as I argue, *techn-ology* is inquiry into tools and techniques insofar as they can help determine experimentally what is desirable and then secure it as a good, then technology is the best shot that we have at solving our problems. I fail to see the tautology here. Technology as inquiry is self-reflective and self-correcting: it develops new tools as a response to its own failures (and its successes, too) which are then utilized the next time a problematic situation occurs. This is hardly a tautology. Technology in the sense in which I am using the term can, of course, be problematic. It can fail to meet the demands of novel situations and thereby require "re-tooling." Sometimes problems are so great that they defy even the best of our efforts.

Thompson complains that I count him a part of the analytic tradition in philosophy. This is by no means the case, as a careful reading of page 163 will demonstrate. In fact I take great pains to differentiate his work from analytic philosophy as it has been historically understood. I do say that he has engaged in careful analyses of the problems he has chosen to engage, but that could hardly be taken as anything but high praise.

He also complains that precious few black boxes get opened in my book. In the sense in which his excellent work opens the black boxes of agricultural ethics, for example, he is correct. In PTTC I attempt to work at a different level. PTTC is concerned with the cultural critique of technology. This is the level at which there is still considerable public debate about matters such as whether creationism (or "intelligent design," as its proponents now call it) should be taught alongside evolution in the schools, whether technoscience is merely a form of literature, whether and in which ways the arts and the technosciences can cooperate to effect social change, and even whether methods and results in the technosciences are transparent or opaque to the general public. In other words, I am attempting to discuss techniques and technology at the level at which the whole concept of opening black boxes has to be presented as an alternative to authoritarian, *a priori*, and other forms of quasi-inquiry.

Because this is precisely what my book is about, I am puzzled about Thompson's complaint that I have not accomplished a "reorientation of disciplinary

philosophy toward more specific engagement with problems of non-philosophers." I would submit that my book is filled with examples of just this type of effort, including the discussions listed in the previous paragraph.

In fine, Thompson is concerned that my book is neither sufficiently pragmatic nor sufficiently about technology. If judged in terms of the set of questions that motivates his own research, and in terms of his own understanding of pragmatism, he is probably correct. What I have tried to suggest in this brief reply, however, is that Dewey's pragmatism, though by no means infallible, does possess the tools to engage our technological culture at a more general cultural level than the one at which Thompson pursues his own research. I argue that Dewey's pragmatism can open up the spaces between scientism and fatalism, and between analytic philosophy and post-modernism, for fruitful inquiries of the sort in which Thompson himself has been so successful.

It is now time to thank each of my six respondents. Their remarks have prompted me to revisit portions of my book that I now see were insufficiently clear, and to rethink various of its arguments that in retrospect have proved less convincing than I had thought. I am fortunate to have six such capable and generous readers.