

**Technology for Life and the
Problems of Critical/Postmodern Technology Theory**

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In the preface to *On the Advantage and Disadvantage of History for Life*, Nietzsche proposes an aim for the study of history that informs his entire philosophical project:

Our aim will be to show why instruction which fails to quicken activity, why knowledge which enfeebles activity, why history as a costly intellectual excess and luxury must, in the spirit of Goethe's words, be seriously hated; for we still lack what is most necessary, and superfluous excess is the enemy of the necessary. . . . That is, we require history for life and action, not for the smug avoidance of life and action, or even to whitewash a selfish life and cowardly acts. Only so far as history serves life will we serve it (Nietzsche 1980, preface).

Might one say the same of technology? Is it possible to develop a technology that serves life as a means of countering the life that so often today seems to serve technology? The aim of my current project, of which this work is a larger part, is to develop such a technology on the basis of classical pragmatism.

In this paper, I argue that Nietzsche's philosophy of history for life can establish a goal for technology, that of "technology for life." Technology for life would serve the goal of creative self-making. Developing a theory of technology for life would require a theory to accomplish three goals: it would be critical, constructive, and democratic. While the two main bodies of political theory regarding technology—critical theory and postmodernism—are quite effective at criticism of technology, they are much weaker with regard to being constructive, and any attempt that they do make at constructive

technology while at the same time furthering democratic goals founders on their intellectual roots. I suggest as an alternative a critical pragmatism rooted in Chales Sanders Peirce and John Dewey, and show that such an approach can be simultaneously critical, constructive, and democratic.¹

Technology for Life

In seeking a philosophy for life, Nietzsche does not look merely for a philosophy that allows one to go through the daily tasks in some way that is more meaningful than a blind acceptance of daily routine. Such a philosophy would be a “knowledge that enfeebles activity,” or a philosophy for a “smug avoidance of life and action.” Nietzsche seeks a philosophy that generates life in the form of a will to power. Life is, Nietzsche writes in *Beyond Good and Evil*, “essentially appropriation, injury, overpowering of what is alien and weaker; suppression, hardness, imposition of one’s own forms, incorporation and at least, at its mildest, exploitation (Nietzsche 1989, §259).” Those who live are those who seek to exercise their power on the world, making it “theirs,” dominating that around them.

Nietzsche’s concept of power should not be considered synonymous with coercive force or political authority as we see it today. The word that Nietzsche uses for power, *Macht*, derives from the German words for desire and potentiality (Ansell-

¹ A caveat is necessary at the outset of this paper. While the rhetorical structure of the paper is framed otherwise, the aims of this inquiry are quite limited. I do not attempt here an exhaustive criticism of the existing literature on the political theory of technology, even just that within the frameworks of postmodernism and critical theory. My goal here is to establish the initial plausibility of two propositions as a means of justifying further inquiry through a preliminary examination of a few major works in the field: that critical theory and postmodernism struggle to be both constructive and democratic, and that classical pragmatism presents several possible advantages in this regard. The arguments below are made only within these limitations.

Pearson 1994, 46) and shares a common root with *machen*, “to make.” This suggests a close relation between power and creative activity. The will to power cannot be considered simply a will to force or authority in a Weberian sense; it is a will to creative action, a will to realize one’s potential to remake the world. Life is thus about not merely force, but creative action. The person who lives for the will to power, Nietzsche writes, “must have the strength, and use it from time to time, to shatter and dissolve something to enable him to live (1980, §3),” to create something new from what has been destroyed. When Nietzsche describes life as “*essentially* appropriation, injury, overpowering . . .” et cetera, the appropriation, suppression, and exploitation is not of another’s person as much as it is of another’s creation, or more to the point, the lack thereof. History, for Nietzsche, is thus properly used, used advantageously, when it contributes to life, that is, to creative action.

To be sure, there is much controversy in the interpretation of Nietzsche, far too much to engage systematically here. Many scholars have found in precisely this creative activity at least a dangerous potential for breaking down, if not an active subversion of, peaceful political order (Detwiler 1990, for example). Certainly, Nietzsche himself saw his thought in such terms, as the passage from *Beyond Good and Evil* quoted above shows. But the above interpretation is not as implausible as it may seem at first glance. Those who see Nietzsche in strongly individualistic terms, such as Kaufmann (1974), may be quite sympathetic to a view of Nietzsche’s will to power as a creative will. Deleuze’s (1983) view of a pluralistic Nietzsche rife with conflicts and aphorisms that are central to his thinking has much room for this approach as well. Conceptions of agonistic

democracy rooted in Nietzsche like that offered by Hatab (1995) build on Nietzsche's principles in ways similar to my arguments above.

More broadly speaking, there is a well-recognized middle period to Nietzsche's thought in which he accepts a place for democratic practices (Ansell-Pearson 1994, 90-91). Detwiler's claim that this period represents a deviation from his core themes before and after, and that Nietzsche ultimately rejects the ideas characteristic of works like *Human, All Too Human* and *The Gay Science* (1990, 180-188) is compelling with regard to understanding Nietzsche's own intellectual development. That Nietzsche *entertained* such claims for a substantially more democratic view of life as the will to power, however, supports considering these claims on their own merits, apart from the direction in which Nietzsche himself takes them.

But treating the argument on its merits expands the possibilities for criticism as well. It is quite plausible to see Nietzsche's concept of life as a form of positive liberty. Berlin describes positive liberty in terms of self-mastery and self-realization, language quite similar to Nietzsche's. Indeed, Berlin's description of the ethos of positive freedom sound quite natural in the mouth of the Nietzschean *übermensch*:

I wish my life and decisions to depend on myself, not on external forces of whatever kind. I wish to be the instrument of my own, not of other men's, acts of will. I wish to be a subject, not an object; to be moved by reasons, by conscious purposes, which are my own, not by causes which affect me, as it were, from outside. I wish to be somebody, not nobody; a doer—deciding, not being decided for, self-directed and not acted upon by external nature or by other men as if I were a thing, or a slave incapable of playing a human role, that is, of conceiving goals and policies of my own and realizing them (Berlin 1997 [1958], 203).

If Nietzsche's concept of life is expressible in the language of positive freedom, then Berlin's cogent criticisms of positive freedom undermine life as well. Berlin rightly sees in positive freedom the inherent tendency toward coercion. Self-mastery implies the

possibility of a real self that masters an inauthentic self, and thus also implies that coercing one to obey this real self is coercing them to be free, and thus not truly coercion at all. In the name of freedom all freedom is lost and totalitarianism becomes the height of democracy.

But there are two key features of Nietzsche's thought that work against this in ways not present in other approaches to positive freedom. The first is simply that Nietzsche is not primarily concerned with making others free. Nietzsche's history for life is about a self-overcoming in which "self" is as much a description of the subject doing the overcoming as it is of the object to be overcome. Hence there is no need to coerce others to be "free": one whose self is overcome for them has not overcome anything. A second key feature is the lack of a universal end to be attained, a hallmark of the kinds of positive freedom that Berlin associates with Rousseau or Hegel. While the greatness of culture is a recurrent theme in Nietzsche's writings, this collective end cannot be reduced to the sum of culture in each individual. Hence there is no end to be attained by coercing individuals to conform to some standard of an "authentic" self. These two factors confine Nietzsche's thirst for life to the overcoming of one's self rather than the controlling of others. Even where life requires actual, physical "appropriation, injury, overpowering of what is alien and weaker" as found in others, Nietzschean life recognizes this as a form of coercion, thus breaking the final step in Berlin's analysis, the equation of coercion with freedom. Nietzsche may force the weaker to do many unpleasant things. Forcing them to be free is most assuredly not one of them.

Hence one can see Nietzsche's concept of a history for life as the quest for an understanding of history that promotes a self-overcoming mastery that is expressed in

creative action in the world. History that serves life helps one create one's self through action in the world, a creation that will be different for each person (or at least each person who is capable of overcoming himself). This seems a plausible aim for technology as well. Technology ought to do more than simply save labor. It ought to help people be what they want to be, to act creatively in the world as a way of making themselves. Such technologies could aptly be called "technology for life."²

A Critical and Constructive Theory of Technology

To develop technology for life requires an underlying theory of how technologies can be used to further creative self-making. Developing such a theory is far beyond the scope of this paper. But any such theory would have to accomplish at least three tasks: such a theory must be critical toward existing technology, it must aid the construction of technology that promotes life, and it must, for reasons that will be discussed in the next section, be democratic. Bringing these three requirements together is a very significant challenge, one that has not been met by existing theories of technology.

A theory that is critical of technology is one that allows the development of an evaluative position regarding technology in general and specific technologies. As Iris Marion Young put it,

Critical theory is a mode of discourse which projects normative possibilities

² One sees such a view of technology at work to some extent in popular culture. The message of advertisements for consumer electronics is often one of fulfillment and self-expression rather than utility, for example. The view of technology as a mode of expression might also be at the heart of the increasingly common trend toward fashionable industrial design for high-technology products. If one takes consumer products as an indicator of consumers' understanding of the relationship between themselves and the product (whether the product is effect or cause is not relevant to my point here), then the iPod certainly suggests that technology today is at least as much about the user as about the use.

unrealized but felt in a particular given social reality. Each social reality presents its own unrealized possibilities, experienced as lacks and desires. Norms and ideals arise from the yearning that is an expression of freedom: *it does not have to be this way, it could be otherwise* (Young 1990, 6; emphasis added).

Too often technology is taken in a purely deterministic fashion: an artifact is developed and can be used for a particular purpose, therefore it will inevitably be. One sees this, for example, in advocates of electronic democracy. Tracy Westen argues that e-democracy is “a technological imperative: Because it can happen, it will happen (Westen 2000, 226).” The successive waves of the supposed “democratization” of the Internet—first the World Wide Web, then the blogosphere, and now “Web 2.0,” the realm of social networking and user collaboration—assumes that the democratic possibility of the Internet will transform politics rather than the other way around, as is certainly the case in the first two transformations and, as web sites like MySpace become common tools for corporate media relations, seems increasingly likely in the third as well.³ A theory of technology for life would have to show the users of today’s technology that this determinism is a chimera, that technology does not automatically make manifest its best possibilities.

But to be critical must not mean to be dismissive. The hopelessness toward technology of Rousseau (1987), Heidegger (1977), or Ellul (1964), at least in their simplest (or perhaps most simplistic) readings, is as uncritical as the determinist view.

³ The transformation of the World Wide Web from a decentralized, individualized forum to a tool of existing power structures can no longer be disputed; though anyone can have a web site the most popular sites are those of corporations and other powerful entities. The same appears to be the case with newer Internet technologies. While the blogosphere is still spoken of as a democratizing force in popular media today, the most popular blogs are found on major media sites—Yahoo!, Slate, or ESPN, for example—rather than individual bloggers’ web pages, and blogs are being used by virtually all of the current Presidential campaigns. Social networking sites like MySpace are now hosting pages not only for angst-ridden teens or radical activists but for television shows and movies, suggesting that Web 2.0 will likely follow the established path as much as it will blaze a new one.

Technology as such cannot be rejected; we do things and thus develop technologies whether we like it or not. We might be able to live at a lower level of technology, but technology is an inherent part of human nature. Humans do things and develop techniques for doing so. More importantly, we can neither dismiss the material advances that technology has brought nor deny that it has enhanced our culture as well. To wish the abandonment of modern technology is to wish the early death of many from polio or tuberculosis. It is to wish a return to a way of life of constant physically debilitating toil to meet only the most basic requirements of subsistence. It is to wish the eradication of great cultural achievements—Dave Brubeck’s *Time Out* or Stanley Kubrick’s *2001: A Space Odyssey*—which exist only because of recording and filmmaking technologies. What critics who advocate some sort of rejection of technology would have is not simply a world without modern technology, but a world in which physical, economic, and cultural harms would be committed to perpetuate such a world.

There are two prominent lines of criticism regarding science and technology: critical theory and postmodernism. Admittedly, there is quite a bit of overlap among these with most authors drawing on more than one perspective, but their claims can be separated to develop two distinct criticisms of science and technology. The critiques are both radical, rooted in varying forms of post-Enlightenment thought. They thus offer important criticisms that any adequate political theory of science and technology must engage. But within their radicalism lies their problem: the democratic sympathies of most such critics are undermined by the undemocratic foundations of their critiques, which create problems that the critics have yet to resolve. As such, they can criticize—and their

criticisms identify important challenges—but they can offer no positive program to redress these criticisms within a democratic framework.

Postmodernism bases its critique of science on the concepts of discourse and power. Throughout his work, Michel Foucault shows that technologies are developed and used within the broader frameworks of discourses of power to construct an individual that is amenable to the exercise of that power. This is most clearly expressed in *Discipline and Punish* (1977). Foucault explores the rise of a scientific ideology that sees the body as a resource, as an object on which power may act as a way of shaping the mind to respond to power. Hospitals that arrange patients in a space that is both therapeutic and political, armies that move in perfectly synchronized time, schools that impose a hierarchical class structure, all unified into a single force by tactics of use, create a simple, trainable, docile body that responds to power exercised not through force but through observation, normalization, and examination. These “technologies of the self” (Foucault et al. 1988) produce individuals that police themselves to comply with the power structures around them.

Jean Baudrillard (1994) views modern society as a society in which the real has been replaced by succeeding simulacra, discourses that subvert any notion of reality by imposing some alternative discourse based on structures of power within society. As structures of power become stronger, the simulacra become the real. This can be applied to science, as the discursive structures of science replace the reality of the physical world. His critique of archeology and the museum is a particularly powerful example. By seeking to recreate an ancient civilization, the museum actually creates a simulation of that civilization according to how contemporary archeology understands them, not how

they understood themselves. The attempt to understand them as they understood themselves actually does nothing but impose a modern simulacrum on the original civilization, creating the distinction between modern and pre-modern. Science does much the same, dispelling the pre-modern “myth” with the simulation of modern knowledge. The power of science and technology is to impose the series of simulacra on society. Baudrillard’s analysis recalls, with a somewhat perverse sense of irony that postmodernists would no doubt appreciate, Rousseau’s Emile, who has decided to become what the educator has made him, except that from Baudrillard’s perspective the educator is merely imposing a discourse on Emile rather than leading him to the truth of the general will.

For critical theorists, the problems of science and technology derive not from discourse but from the productive structure of society. Marcuse (1964) sees technology as more than a mere obstacle to the achievement of some good. Marcuse believes that modern science and technology, through their link to industrial society, becomes an oppressing force. Science, he argues, has become the ideology of the industrial age, in which the means of production impose the entire system to the point where resistance is not merely impossible physically but irrational intellectually; what has the potential for liberation becomes in fact the universal oppressor. Marcuse sees this as leading not to physical oppression, but to an ideological oppression dominated by “one-dimensional thought” in which people’s ideas are themselves wedded to the existing technological system. As a consequence of the claims of science, their concepts become limited to those available, beyond which one cannot proceed within the bounds of reason.

Marcuse does not see this as inherent in technology, but in the organization of science and technology in industrial society, which “is organized for the ever-more-effective domination of man and nature (1964, 17).” Fundamentally, technology is capable of great accomplishments. Such accomplishments, however, pose a threat to the existing social order:

“Progress” is not a neutral term; it moves toward specific ends, and these ends are defined by the possibilities of ameliorating the human condition. Advanced industrial society is approaching the stage where continued progress would demand the radical subversion of the prevailing direction and organization of progress. . . . From this point on, technical progress would transcend the realm of necessity, where it served as the instrument of domination and exploitation which thereby limited its rationality; technology would become subject to the free play of faculties in the struggle for the pacification of nature and society (Marcuse 1964, 16).

This threat of subversion is what makes science and technology oppressive. Scientific method becomes a tool by which radical ideas are contained;⁴ technology (especially mass media technology) is used to maintain the ideas and values of the industrial society. “The more technology appears capable of creating the conditions for pacification, the more are the minds and bodies of man organized against this alternative (Marcuse 1964, 17).”

Marcuse offers an alternative to our own use of technology: “the planned utilization of resources for the satisfaction of vital needs with a minimum of toil, the transformation of leisure time into free time, the pacification of the struggle for existence (1964, 253).” His project of truly democratic liberation turns technology from the enemy

⁴ Such a claim becomes startlingly real when one examines arguments against radical social science. Almond (1988), for example, famously dismisses the “soft left table” of political science as unscientific and unobjective; thus Marxists who do not adopt the methods of operationalism and behavioralism cannot truly claim to be scientists. Science in the service of industrial society has thus, precisely as Marcuse predicted, contained ideologies that threaten capitalist industrial society.

that it is into an ally of his “new historical Subject”: the self-determined individual who is free of propagandistic manipulation, “capable of knowing and comprehending the facts and of evaluating alternatives (1964, 252).” Feenberg (1991) elaborates on this solution, envisioning the possibility of “a radical reform of industrial society” that would move technology away from the antidemocratic values built into contemporary technology by its link to capitalist productive forces. Technology embodies the interests of the ruling class in society because that class guides its development. In a society where industrial technology is developed by capitalist industrial firms, profit must be the guiding value of technological development. His solution is to change the locus of control, moving the development of technology away from industrial interests and toward a democratized system of social control. This allows broader values, beyond that of profit, to be incorporated into the development of technology and, by implication, science itself.

These criticisms go far in explicating the challenges that science and technology pose. Each uncovers an important element of the social structure of science and technology. Critical theory and postmodernism thus meet the first requirement for building a theory of technology for life. But in going beyond this requirement these theories become much more problematic. The major inadequacy of these theories is their failure to be reconstructive, to develop concepts that allow the resolution of these challenges. Neither Foucault nor Baudrillard offer any direction in which technology might move that would overcome their criticisms, though many of their successors have made suggestions about how technology can bring about liberation. And while Marcuse and Feenberg suggest revolutionary changes in the process of developing technology (and a revolutionary politics that would be necessary to make that happen), they provide

little guidance as to what the revolution should do with technology once the existing order has been broken. What vital needs should be met; what should technology allow us to do in our free time? How can technology contribute to Why should technology pacify the struggle for existence as opposed to enabling a struggle toward a higher kind of existence, as one might seek in building Arendtian technology? What should technology *be*?

Like Marx's ideal communism, critical theory's ideal technology is ultimately left for people after the revolution to make for themselves. Like Nietzsche's *übermensch* who makes for himself a new ethos, postmodernists give the responsibility of building a new technology on those who have liberated themselves without any guidance on how they might meet that responsibility. This is an especially problematic situation for the advocate of technology for life. If a theory of technology is to help one use technology to further creative self-making, that theory must say something about what kinds of technology can do this. A theory that aims solely at evaluating existing technology is certainly valuable, but the core problem of life is not what to think about what *is* but what to do about what *will be*. That is to say, a theory of technology for life must be a constructive as well as a critical theory. It must show at least how one might go about finding the aims and techniques of a technology that promotes creative self-making, and ideally would do something to specify those aims and techniques in some kind of operational fashion. It is not enough that a theory say with Young that it *could have been otherwise*; it must say also that it *can possibly be thus*.

Democratic Technology for Life

While Nietzsche understood life ultimately in individual terms and sought a separation of the self from social life (at least in his most individualist writings and interpretations), such a separation is not possible in the contemporary world, if it ever was. Our activities take place in a world in which others, too, exist. Indeed if this were not the case it would not be necessary to negate the activity of others in order to live one's own life. We come back, ultimately, to Aristotle's contention that humans are indeed political animals, beings which by our very nature live in a political community (Aristotle 1981, 1253a). Life as a political animal poses a set of problems involving cooperation and competition among individuals in the political community.⁵ The problems of cooperation and conflict posed by humanity's political nature become fundamental problems of human action, of living life as Nietzsche understood it, when that life takes place in a community. Technology for life means confronting the inevitably social nature of technology, a nature that demands democracy in technology.

Nietzsche's affirmation of life culminates in the development of an ethos beyond good and evil, one returning to good and bad in the sense that one affirms one's self in one's ethos. Nietzsche is at best ambivalent on the relationship between such an ethos and democracy. In his early essay "*The Greek State*," Nietzsche argues that, rooted as it is in equality, the ethos of a democratic culture is hostile to the development of great culture

⁵ MacIntyre's (1984) interpretation of Aristotle focuses primarily on the cooperative nature of the political community, relying primarily on the idea of the community as a kind of cooperation that makes virtue possible. But Yack (1993) argues persuasively that Aristotle's attention to matters such as the distribution of political power reveal an emphasis on conflict rather than cooperation. It is likely that both are right; Aristotle's politics are about both cooperation and conflict, and these problems of action within a political community are fundamental elements of the human condition, as Arendt (1958) realizes in her critique of the modern rejection of the *bios politikos*.

(Ansell-Pearson 1994, 71-78), an idea echoed quite clearly in Nietzsche's later works such as *On the Genealogy of Morals*. And yet in *Human, All too Human*, Nietzsche does allow that some level of freedom secured by democratic government is necessary for the modern state to make life endurable for the masses, provided that this does not become the entirety of cultural life, as it clearly has in Nietzsche's view of modern politics (Ansell-Pearson 1994, 90). One might even go further to argue that there is a certain minimum of negative liberty and meritocratic equality of opportunity, perhaps something like that depicted in Pericles' Funeral Oration, necessary for the noble to emerge and be renewed, lest the nobility degenerate into a simple plutocratic degeneracy seen in, for example, many caricatures of the pre-Revolutionary French aristocracy. At the very least, one can say that the ethos of life can be facilitated by the right kind of democracy, which would serve technology for life similarly.

But the same limited argument for democracy cannot suffice in the case of a technology for life. The ethos of life is created by the individual, who merely needs sufficient space in society to create. This is not so for technology. Technology is a social product; it is created and used not by a solitary individual but rather by groups. The individual who wishes to use technology for affirming life, for creative self-making, finds only the technologies that have been created by those around her. Most people are not in a position to create new technologies themselves. Moreover, the decisions that others make about technologies can constrain a person in ways that those people's decisions about ethics do not, for example, the expectations to one will use a car or a Blackberry. The independence that is present in the quest for a life-affirming ethos is contrasted with an interdependence in the case of life-affirming technology. Technology cannot be used

for self-making if the self in question cannot control it. Hence some element of collective control over technology is necessary if we are to develop a technology for life. A theory of technology for life must tell us how to do so.

Here is where critical theory and postmodernism fail as theories of technology for life. One could, in principle, envision developing Marcuse or Baudrillard into constructive theories of what technology should be in a substantive way. But if one does so, one undermines their hope for doing so democratically. Neither critical theory nor postmodernism are capable of building a simultaneously constructive and democratic theory of technology, adept as they are at making cogent critiques of contemporary technology's undemocratic nature. Both are rooted in undemocratic intellectual structures that, while enabling them to offer sometimes devastating criticisms, prevent them from building new technologies while remaining true to their democratic aspirations.

Nietzsche's genealogical method is well suited to the postmodern project of intellectual liberation from the strictures of the Enlightenment. Foucault's essay "What is Enlightenment?" calls for a genealogical method that seeks to expose the origin of especially the epistemological structures of the Enlightenment, much as Nietzsche does for Christian morality in *Beyond Good and Evil* and in *On the Genealogy of Morals*. In the process, the method undermines the purportedly objective claims to legitimacy of those structures in showing that they originate not in some objective reality but in a system of power relations. By undermining this legitimacy, postmodernism is able to undermine the claims of such systems of knowledge to objectively prescribe behavior or to define objective understandings of action; this is precisely the task of Baudrillard's work. Similarly, understanding the will to power as a will to creative action enables, in

principle, postmodernism to translate intellectual liberation into a program of political action. The first step in affirming life is to overcome the limitations imposed by others.

The postmodern efforts at political liberation closely parallel those at intellectual liberation and are linked by a call for action to break down existing restraints imposed by others. In practice, however, postmodernism has been limited to efforts to undermine existing limitations on the self. This is in essence a solely negative political program. The destruction that Nietzsche calls for as a part of the will to power is intimately attached to creation of something new; it is the destruction of the other for the creation of the self. Postmodernism has not moved to the new creation, much as Christianity in Nietzsche's thought did not create a new morality, merely turning the old on its head. This makes postmodernism appear as something of a new slave morality rather than the morality "beyond good and evil" for which Nietzsche calls.

There is a reason for this resistance to a positive program, however. The difficulties of Nietzsche's political theory come not so much in the destructive aspects of his philosophy as in the creative aspects of it. The calling to a life that is "*essentially* appropriation, injury, overpowering of what is alien and weaker; suppression, hardness, imposition of one's own forms, incorporation and at least, at its mildest, exploitation" results not from his identification of morality as a limitation on the will to power as from his calling to exercise the will to power. If one does not address the creative aspects of the will to power, then one need not concern one's self about its affects on others. If one is merely destroying the old, then the need to create a new structure that, by definition, will oppress others is eliminated. A reconstructive postmodernism would have to confront Nietzsche's antidemocratic views, his hard teachings, his calling *for* oppression.

Such would undermine the liberatory aspects of contemporary postmodernism, and with it the positive program that any contemporary postmodernist might propose, including those aimed at science and technology. Any positive system must itself be a simulacrum, a technology of power over others' selves, and must then be seen as an impediment to the postmodern project of liberation.

Richard Parrish (2006) astutely characterizes this problem as one of the inevitability of discursive violence. Relying initially on Derrida's characterization of discourse as inherently violent (in that to disagree is in a sense to dehumanize), Parrish shows that pure non-violence is impossible, since to be purely non-violent toward another's discourse is to treat them as if they are not an interlocutor worthy of argument, that the other's ideas are not worthy of engagement. This becomes the most perfect form of violence, the fullest form of dehumanization. And yet perfect violence, in which one purely disregards the other, becomes perfectly non-violent as there is nothing in one's own discursive acts that would confront the other. Within a postmodern framework, then, discursive violence is inevitable. While Derrida's solution, Parrish argues, is to make a preference for deconstructive action that levels the playing field of discursive violence, Parrish opts instead for an economy of violence that seeks what I might characterize as an Aristotelian mean at which violence is minimized.

In either case, however, democracy, whether technological or otherwise, is at best an aim that can never be reached. A fundamental premise of democratic governance is some kind of equality appropriate to that which is being democratized; at a minimum, this means that there must be an equality of humanity among those participating. Dehumanizing the other clearly violates this. Derrida's solution to minimizing this

antidemocratic dehumanization is to limit himself to critique, thereby equalizing the dehumanization of all in contrast to the existing inequality of contemporary discursive practice. Parrish's solution can be constructive but recognizes that whatever is constructed is done through violence, placing an inherent limit on the extent of democratization. Either way, the aim of a theory that is at once critical, constructive, and democratic seems far off.

Critical theory confronts a similar problem in attempting to build a democratic politics of science and technology on Marxism, in this case foundering on the problem of orthodoxy and totalitarianism. Both Marcuse and Feenberg recognizes the need for some kind of revolution to realize the possibility of a democratic science and technology.

Marcuse writes,

The enchained possibilities of advanced industrial society are: development of the productive forces on an enlarged scale, extension of the conquest of nature, growing satisfaction of needs for a growing number of people, creation of new needs and faculties. But these possibilities are gradually being realized through institutions which cancel their liberating potential, and the process affects not only the means but the ends. The instruments of productivity and progress, organized into a totalitarian system, determine not only the actual but also the possible utilizations (255).

Revolution is necessary because the liberation of technology for the forces containing it requires separating it from institutions that leave it in the service of one particular class of society. But this poses the problem of dissent, a problem that is particularly vexing. This was a problem clearly recognized by Marx, and even more clearly by Lenin. If ideology derives from the existing social order, as Marx makes clear in *The German Ideology* (1978), then disagreement is more than simply dissent. Those who disagree with the revolutionary goals are expressing the views of the old order; they are not dissidents but counterrevolutionaries. They must be fought, not reasoned with, for their goal as

counterrevolutionaries must be nothing less than the preservation of the old order and the destruction of the revolution.

From this comes the quite intractable problem of orthodoxy and totalitarianism. The heterodox are working against the revolution; those who are not with the revolution truly are against it. The use of repression is necessary to preserve the revolution from its enemies, even when those enemies share the same goal but differ over means. Lenin's argument for violent revolution and the vanguard party in "What is to be Done?" (1975) is a recognition of the necessity of orthodoxy and totalitarianism. The vanguard party must maintain the ideological purity of the revolution because to do otherwise is to allow counterrevolutionary activity and thus the destruction of the revolution. The party must have total control because to allow counterrevolutionary activity is to give power back to the bourgeoisie, who will use their power to undo the revolution. Thus, given the nature of Marxist revolution, totalitarianism and the enforcement of orthodoxy are necessary consequences. Lenin clearly accepts this, and dispenses with any recognizable concept of democracy as a consequence. Contemporary critical theory, however, does not. Thus, when Feenberg notes:

But, with the notable exception of Marcuse, these Marxist critics of technology stop short of actually explaining the new relation to nature implied in their program, and none of them come close to meeting the demand their work elicits for a concrete conception of the "new technology" they invoke (1991, 13)

he identifies more than a gap in critical theory, but a wall that inevitably limits the advance of critical theory toward a positive political vision.

Even if one can manage to avoid Stalinism in the ways that critical theorists suggest, the problem that this creates for Feenberg is that of managing a democratic transformation of society that necessarily excludes a part of it. The truly critical edge of

his work is the claim that a radical transformation of society is necessary to address the challenges of science and technology. If technology embodies the values of the ruling class, as he says, then the incorporation of alternative values requires the creation of a new ruling class, in this case the class of people to be represented through his radical democracy. His claim is revolutionary, and it takes, as critical theory does in general, the problem of ideology very seriously. And if ideology is an artifact of class position, then those who hold the existing values—that technology should be driven by profit and efficiency—represent the class that is to be overthrown and excluded from the post-revolutionary society. But if some groups cannot be part of such a society, how democratic can Feenberg's revolution be? As in Marxism in general, critical theorists must confront the fact that the democratic revolution is impossible if the revolution is directed against a particular class of people. Feenberg's democratic revolution that excludes the owners of the means of production is as doomed as a French Revolution that, in the name of the nation, excluded the aristocracy from the nation (Sieyes 1964).

Thus both critical theory and postmodernism have internal limits on their ability to develop a positive political program in ways that are consistent with democratic governance. In both cases, their ability to offer criticism is quite powerful. There is no denying that the development of technology is inextricably linked to political economy of capitalism, or that science reflects the gender biases of a patriarchal society. But what can be done about this? The easy answer is to change these conditions, but that requires specification of new conditions to be created and a means of creating them within the framework of democratic political practices. And this is precisely what these critical perspectives cannot do because of their internal limitations.

Critical Pragmatism as an Alternative

The first problem of building technology for life is to build a theory that can be critical, constructive, and democratic. The two main lines of inquiry have succeeded in the first but must fail at either the second or the third. Clearly an alternative is needed. But the search for an alternative cannot dismiss the success of existing critiques simply because they are limited to critique. Hence we see a hint of a fourth requirement as well: such a theory must be pluralistic, that is, admitting of many lines of reasoning rather than just one such line.

At this conference last year, I presented an approach to technology rooted in the classical pragmatism of Charles Peirce and John Dewey (Johnson 2006), an approach that I believe can accomplish these tasks. The critical pragmatism that I explicated is founded on two key principles of pragmatism. This first is an understanding of technology based on Peircean semiotics. Peirce held that both cognition and meaning are composed of three elements. The sign of a meaning is the wholeness of the thing meant. The object is the set of characteristics to which the sign refers. To these two very conventional elements Peirce adds a relational element, the representamen. The representamen of a thing is the set of relationships between the thing meant or cognized and other signs-object combinations, embodied in characteristics like uses, processes, concepts, and values. I extended this to the ontology of a thing as well; all things are social constructs of physical characteristics and relationships unified in socially created ideas. In the case of technology, this means that technologies are not simply value-neutral artifacts but rather value-laden practices to be understood as systems for doing things.

This semio-ontological understanding of what a technology is was combined with a unique understanding of science as a way of relating one's self to the world. Science is not a mere process for discovering facts for Peirce; rather science is an experimental outlook on how to be in the world. One's concepts about that world form the starting point for inquiry motivated by uncertainty about what one should do. One chooses an action in a provisional commitment to certain beliefs, but then looks critically for the expected consequences of those beliefs in action: beliefs are responsive to experience. When those expected consequences are not those that actually come to fruition, one revises one's beliefs accordingly.⁶ In the case of technology, this suggests that both users and developers must be aware of the concepts built into technologies, review them critically in their use, and respond to those uses by adapting not simply the uses or even the artifacts themselves but the concepts and values that are built into those technologies.

This perspective, I argued previously, is inherently critical because it posits an obligation to look critically at the process of social construction. It says, as Young might have, that technology does not have to be the way that it is, that technology could be otherwise, and that technologies were not determined by unchanging nature but made by human choices that can be unmade as well. From the principles developed in that paper one can see how a critical pragmatism toward technology meets the other requirements of

⁶ Peter Ochs (1993) compellingly argues that Peirce's method, which he characterizes as a "logic of postmodernism," is best illustrated not in his explicit writings on the subject but on his "habit of self-critical yet self-affirming thinking (43)." I find this way of reading Peirce persuasive, as well as implicit but unformulated in my thinking about Peirce in last year's paper. While Peirce's explicit language seems quite straightforwardly conventional, the use to which he puts this approach, as a way of critically constructing one's self in the world by being responsive to experience, is central to the argument previously that pragmatism's heavy reliance on science does not constitute a privileging of it. That would clearly be a fatal flaw in a theory of technology. Ochs' perspective makes it much more clearly that Peirce avoids this than my previous paper.

technology for life as well. It remains pluralist in this criticality, making no methodological assumptions about *which* social forces play the most important role in these choices; there are many forces that can come into play, and which ones do so are an empirical, not methodological, question. That pragmatism is constructive should be clear from Peirce's method. One starts with one's existing beliefs and criticizes them with the aim of action, not simply with the aim of criticism itself. The fixation (at least provisionally, as I describe below) of belief, not simply the challenging of it, is at the heart of pragmatic inquiry into any endeavor, technology no exception. While pragmatic inquiry does not in itself provide any substantive guidance for a technology for life, at the very least the method that it establishes posits a responsibility to move from criticism to construction, or more properly, it establishes a mode of criticism that has reconstruction rather than deconstruction as its aim.

But can this approach be both constructive and democratic within the framework of technology for life? Pragmatism is, of course, widely regarded as a philosophy of democracy. That it can be democratic in most senses in this process of criticism and construction is amply demonstrated by John Dewey in *The Public and its Problems* (1954). There Dewey shows that the process of making and carrying out public policy is itself a process of scientific inquiry that is best executed through deliberative democratic processes. As a pluralistic theory that encourages responsiveness to experience, it need not exclude anyone simply because they have been identified as an obstacle to progress as critical theory must; capitalists are capable of responding to experience as well as workers, and even when the capitalists themselves don't the public discourse can respond to the claims of capitalists with their own experience, not automatic exclusion.

The challenge, however, is to overcome the specific democratic failings of postmodernism. A theory so reliant on the construction of meanings must be especially sensitive to Derrida's claim that assertion of an idea is a form of violence, and with it to the conclusion implicit in Parrish that democracy is not fully possible. Pragmatism overcomes this challenge by positing a mode of discourse that is both non-violent and humanizing because it sees all discourse as ultimately both fallible and corrigible. For Peirce, the virtue of the pragmatic approach to science is not that it is always right but that it is self-correcting:

The first inferences a scientific man makes are very uncertain. Not infrequently, if their value were to be rated simply on the basis of the chances in favor of their being strictly true, they would be worth much less than nothing; for they are much more likely to prove false than true. But knowledge must begin somewhere as well as it can. Those inferences are not valueless, because scientific inquiry does not rest upon them, but goes forward until it refutes them; and in refuting them gains indications of what theory ought to be tried next (Peirce 1998, 25).

The beliefs that one asserts within the framework of scientific inquiry are always to be taken provisionally, as best guesses at what the state of things is, acknowledging that these guesses remain orders imposed on nature as one observes it. And the scientific outlook demands that one respond to experience that challenges one's beliefs about it because one must recognize that one's beliefs are at least as likely to be wrong as they are to be right. The scientific mode of being in the world rests ultimately on having the "Will to Learn," a will that demands that one be unsatisfied with the current state of one's own opinions and that one wishes to see inquiry resolve that dissatisfaction (Peirce 1998, 47).

This mode of being overcomes the problems so astutely seen by Nietzsche, Derrida, and Parrish. Discourse is only violent if my assertion denies that of the other. This is the essence of Nietzsche's claim that life is "appropriation, injury, overpowering of what is alien and weaker; suppression, hardness, imposition of one's own forms,

incorporation and at least, at its mildest, exploitation”: to assert myself requires that I deny the other, thereby reducing the other to something subhuman. This is why Derrida characterizes discourse as violent, and why Parrish finds this violence unavoidable. A discourse that asserts the truth of one’s belief is violent to the other; one that asserts it as true only for one’s self does violence to one’s self. But pragmatism shows a mode of discourse that moves around this problem. By making an assertion provisional, it can simultaneously be an assertion of one’s own humanity (as a best guess at what things are) while at the same time recognizing the other’s as well by recognizing that one could be wrong and, most importantly, by inviting both to share a Will to Learn. Rather than a discourse that expresses the self against the other, pragmatic inquiry proposes a discourse that is “us together,” creating a cooperative and mutual self-affirmation. Such a mode of inquiry can guide a technology that furthers creative self-making because the self is a part of the collective technology making rather than something that struggles against it and those that created it.

Thus critical pragmatism serves as an at least initially plausible alternative starting point for developing a technology that furthers creative self-making. Incorporating existing critiques while positing a method of finding constructive uses of technology, the approach preserves the achievements of critical theory and postmodernism while overcoming their limitations. Its inherently democratic nature promises to do so both more effectively in that it can situate creative self-making technologies within a social process that creates those technologies and more justly in that it does so while neither

excluding those who pose obstacles to such technology nor dehumanizing those involved in the conflicts that are inevitable in that process.

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