

SYMPOSIUM ON QUESTIONING TECHNOLOGY BY ANDREW FEENBERG
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From the Question Concerning Technology to the Quest for a Democratic Technology: Heidegger, Marcuse, Feenberg¹

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Abstract

Andrew Feenberg's most recent contribution to the critical theory of technology, *Questioning Technology*, is best understood as a synthesis and extension of the critiques of technology developed by Heidegger and Marcuse. By thus situating Feenberg's endeavor to articulate and preserve a meaningful sense of agency in our increasingly technologized lifeworld, I show that some of the deepest tensions in Heidegger and Marcuse's relation re-emerge within Feenberg's own critical theory. Most significant here is the fact that Feenberg, following Marcuse, exaggerates Heidegger's 'fatalism' about technology. I contend that this mistake stems from Feenberg's false ascription of a technological 'essentialism' to Heidegger. Correcting this and several related problems, I reconstruct Feenberg's 'radical democratic' call for a counter-hegemonic democratization of technological design, arguing that although this timely and important project takes its inspiration from Marcuse, in the end Feenberg remains closer to Heidegger than his Marcuseanism allows him to acknowledge.

I. Introduction

Richard Wolin has remarked that '[t]he full story of Marcuse's relation to Heidegger has yet to be written.'² Indeed, there are at least two stories to be told about the Marcuse-Heidegger relationship: the story of its historical past and the story of its philosophical future. Let us hope that intellectual historians like Wolin will continue to bring the past of this important relation to light; in the meantime, Andrew Feenberg has already begun writing the philosophical story of its future. The goal of his *Questioning Technology* is to articulate a critical theory capable of responding to '[t]he fundamental problem of democracy today,' namely, the question of how to 'ensure the survival of agency in this increasingly technological universe' (p. 101). To meet this challenge, Feenberg synthesizes and extends the critiques of technology developed by Heidegger and post-Heideggerian thinkers like Marcuse and Foucault. My approach will seek to situate Feenberg's project within this historical perspective.

II. The History Behind Feenberg's Heidegger-Marcuse Dialectic

Marcuse studied with Heidegger from 1928 to 1932, and Feenberg was a Marcuse student during the late Sixties.³ This, of course, makes Feenberg one of Heidegger's intellectual grandchildren. But this is a genealogy fraught with political and philosophical tensions, tensions which occasionally make themselves felt in Feenberg's interpretations and which point back to the fact that Marcuse himself broke with Heidegger bitterly—and permanently—in 1948. To Marcuse, Heidegger's strong early support of National Socialism represented a fundamental betrayal of Heidegger's own 'existential' philosophy, and thus an abandonment of 'the greatest intellectual heritage of German history,' and he said so at the time.⁴ In 1933 and 1934, while Heidegger was making political speeches on Hitler's behalf, Marcuse was fleeing Hitler's rise to power, first from Frankfurt to Geneva in 1933, then emigrating to New York in 1934, where he served as the philosophical specialist for the now exiled Frankfurt School. During this period, Marcuse wrote *Reason and Revolution*, defending Hegel's notion of the state—as 'a social order built on the rational autonomy of the individual'—against the 'pseudo-democratic ideology' characteristic of fascism, which pays lip service to the direct rule of the 'people' [Volk] while in fact 'the ruling groups control the rest of the population directly, without the mediation of...the state.' Hitler had abolished all such democratic mediation, so Marcuse concludes *Reason and Revolution* by quoting Carl Schmitt's proclamation that on January 30th, 1933, 'the day of Hitler's ascent to power "Hegel, so to speak, died."' ⁵

Marcuse's post-Heideggerian return to Hegel was of course also a return to Marx; he was elaborating the major philosophical sources of Frankfurt School critical theory. But around this time Max Horkheimer, who directed the Institute for Social Research and controlled its finances, began working closely with another philosopher, Theodore Adorno. Adorno, whose hatred for Heidegger apparently spilled over onto Marcuse, wrote to Horkheimer in 1935 to remind him of the 'illusions' Marcuse had so recently had 'of Herr Heidegger, whom he thanked all-too-heartily in the foreword to his (1932) Hegel book.' Adorno went so far as to accuse Marcuse of being 'hindered [only] by Judaism from being a fascist'!⁶ Whether or not Adorno's vicious intrigue succeeded, Marcuse soon found Institute funds in too short a supply to continue supporting him and his family. Thus it was that Marcuse, the philosopher now best remembered as the intellectual guru of the New Left (and thus the mentor of New Left philosophers like Feenberg, Angela Davis, and Douglas Kellner), found himself working for various American Intelligence agencies from 1942 to 1951.⁷

This is less strange than it sounds. Marcuse actually spent the final years of the second World War doing 'de-Nazification studies' for the Office of Strategic Services. Here, with two other prominent members of the Frankfurt School (the legal scholar and economist Franz Neumann and the political theorist Otto Kirchheimer), Marcuse engaged in an intensive interdisciplinary effort to uncover and 'eliminate the root causes that had produced fascism.' Looking back in 1954, however, Marcuse would conclude that: 'The defeat of Fascism and National Socialism has not arrested the trend toward totalitarianism.'⁸ The fundamental political threat to democracy had not been rooted out; it had merely changed forms and continued to spread after the War. Marcuse called this new, post-fascist form of totalitarianism 'technocracy.' A technocracy is a political state in which 'technical considerations of imperialistic efficiency and rationality supersede the traditional standards of profitability and general welfare.'⁹ For the rest of

Marcuse's long and fruitful career, his overriding question became: How can the increasingly global technocracy be subverted, that is, democratized? This is precisely the quest behind Questioning Technology, the project that Feenberg takes up—with Heidegger's help.

Of course, Marcuse himself would not have looked to Heidegger for help. Marcuse was deeply dissatisfied by Heidegger's private admission of a 'political error'; he expected Heidegger to publicly announce his political change of 'allegiance' (as Nazi opportunists like Schmitt and Alfred Bäumler had done right after the War, a disingenuous act that Heidegger, the thinker of authenticity, found simply 'loathsome').¹⁰ Marcuse warned Heidegger that his refusal to make such an apology would be interpreted as a continuing 'complicity' with Nazism, but Heidegger obstinately refused.¹¹ Thus a controversial stalemate was reached, and Marcuse and Heidegger would remain personally and professionally estranged for the rest of their lives. Unfortunately, as Feenberg shows, this mutual estrangement led them to neglect the important insights contained in each other's work on technology. Feenberg brings out remarkable similarities between Marcuse's critique of technocracy, the technologically-mediated production and maintenance of a one-dimensional society, and Heidegger's ontological critique of enframing, the technological understanding of being which turns everything it touches into a mere resource.¹² Indeed, Feenberg stages a forceful post-Marcusean return to Heidegger, and thus presents in absentia much of Marcuse and Heidegger's missing interlocution on the essence of modern technology.

True to the philosophical spirit of Marcuse, Feenberg's critique of Heidegger is thoroughly dialectical. Its negative or critical moment seeks to isolate Heidegger's deepest insights into technology, preserving these insights from distortions Feenberg blames on Heidegger's 'techno-phobic' (p. 151) and 'essentialist' (p. 3) understanding of technology. In the positive moment of his critique, Feenberg appropriates several of Heidegger's insights, incorporating these in a powerful new way into his own critical theory of technology. In so doing, he demonstrates the continuing importance of the Heideggerian critique of technology while going beyond Heidegger—and Marcuse—in significant respects.

III. Feenberg's Marcusean Critique of Heidegger

Feenberg argues that the four major types of theories of technology (determinism, instrumentalism, substantivism, and critical theory) can be differentiated by the answers they each give to two basic questions (p. 9). For Feenberg, Heidegger's first answer represents an unsurpassable historical advance beyond determinism and instrumentalism, but Heidegger's second response pinpoints where his 'substantivist' view goes wrong and needs to be superseded by Feenberg's own critical theory. The first question is: Is technology neutral or is it value-laden? As Feenberg argues, Heidegger undermines once and for all the belief that technology is neutral by showing that the technological doer comes to be historically 'transformed by its acts' (p. 206). Heidegger's understanding of technology thus overturns both traditional Marxist determinism (according to which technological advance will inevitably usher in the golden age of communism), and liberal instrumentalism (which understands technology merely as an instrument of progress, a set of tools which can be used transparently to achieve independently chosen ends). As Feenberg puts it, Heidegger shows that 'technology is not merely the servant of some predefined social purpose; it is an environment within

which a way of life is elaborated' (p. 127). And thus, 'for good or ill, the human manner of inhabiting the environment can only be [an] ethical' question.¹³

Heidegger's answer to this ethical question concerning technology argues that technology has an ontological impact which is far from neutral. As technology colonizes the lifeworld, everything 'sucked up' into its purview, including the modern subject, is reduced to the ontological status of a resource to be optimized. Within our current technological 'constellation' of intelligibility, '[o]nly what is calculable in advance counts as being.'¹⁴ This technological understanding of being produces a 'calculative thinking' which quantifies all qualitative relations, reducing all entities to bivalent, programmable 'information,' digitized data, which increasingly enters into what Baudrillard calls 'a state of pure circulation.'¹⁵ As this historical transformation of beings into resources becomes more pervasive, it increasingly eludes our critical gaze; indeed, we come to treat even ourselves in the terms underlying our technological refashioning of the world: no longer as conscious subjects in an objective world but merely as resources to be optimized, ordered, and enhanced with maximal efficiency (whether cosmetically, psychopharmacologically, genetically, or cybernetically).¹⁶ For Heidegger, the 'greatest danger' of our spreading technological understanding of Being is the possibility that we will lose the capacity to understand ourselves in any other way.

Feenberg seems to agree with Heidegger's basic diagnosis of technology's ontological impact, but thinks that Heidegger overstates the danger because he ignores resources internal to technological society capable of combating this ontological devastation. This brings us to the second question Feenberg uses to categorize the field of technological theories, the question which differentiates Feenberg from Heidegger: Can the historical impact of technology be humanly controlled, or does it operate according to its own autonomous logic? Is humanity capable of guiding the historical direction in which technology is taking us? No, Heidegger answers; what is most essential about technology—namely, the way in which it alters how reality shows up for us—cannot be controlled.¹⁷ As Heidegger writes: 'No single man, no group of men, no commission of prominent statesmen, scientists, and technicians, no conference of leaders of commerce and industry, can brake or direct the progress of history in the atomic age.'¹⁸ This answer reveals what Feenberg most fundamentally objects to in Heidegger's approach: Heidegger attributes an autonomous logic to technology. This fatalistic 'substantivism' stems ultimately from Heidegger's essentialism, Feenberg contends (p. 17), and it leads Heidegger to advocate 'liberation from [the technological order] rather than [its] reform' (p. 198).

But Feenberg's reading is never so hermeneutically violent as when he accuses Heidegger of being a technological 'essentialist.' Heidegger's paradoxical-sounding claim that 'the essence of technology is nothing technological' does not mean that technology leaves no room for 'reflexivity' (p. 207). Heidegger is really expressing the paradox of the measure; height is not high, treeness is not itself a tree, and the essence of technology is nothing technological. To understand the 'essence of technology,' Heidegger says, we cannot think of 'essence' the way we have been doing since Plato (as what 'permanently endures'), for that makes it seem as if 'by the [essence of] technology we mean some mythological abstraction.' We need, rather, to think of 'essence' as a verb, as the way in which things 'essence' [west] or 'remain in play' [im Spiel bleibt].¹⁹ 'The essence of technology' thus means the way in which intelligibility happens for us these days, that is, as 'enframing' (the historical 'mode of revealing' in which things show up

only as resources to be optimized). Heidegger's historical understanding of the 'essence' of technology may actually put his position closer to the 'constructivist' than the 'essentialist' camp, and it becomes clear that Feenberg shares a similar view when he advocates 'a historical concept of essence' in the book's concluding chapter (p. 201).

What Feenberg really objects to, it seems, is Heidegger's claim that the appropriate response to technology is best characterized by the comportment toward phenomena Heidegger calls *Gelassenheit*, that is, releasement, equanimity, composure, or 'letting-be' (p. 198)—not 'resignation and passivity,' as Feenberg rather polemically translates the term at one point (p. 184). But Feenberg gives a more sympathetic treatment of the notion of *Gelassenheit* later, when he writes: 'Heidegger's undeniable insight is that every making must also include a letting-be, an active connection to the meanings that emerge with the thing and which we cannot "make" but only release through our productive activity' (p. 198, my emphasis). If the 'criteria for constructive reform' (p. 189) Feenberg seeks are to be found anywhere in Heidegger's view, it is here. In fact, 'Gelassenheit' is one of the main criteria that the Amish use when deciding for or against the integration of a new technological device into their community. To some this example may seem its own refutation, but the critical theorist of technology can learn much from the Amish, who are not 'knee-jerk technophobes,' but rather 'very adaptive techno-selectives who devise remarkable technologies that fit within their self-imposed limits.' The Amish may actually have achieved Heidegger's ideal of a 'free relation to technology,' according to which we should 'affirm the unavoidable use of technical devices, and (p. yet) also deny them the right to dominate us, and so to warp, confuse, and lay waste to our nature.' Heidegger is not a Luddite, but rather advocates a non-addicted 'proper use' of technical devices in which we keep ourselves 'so free of them, that we may let go of them at any time.'²⁰ He says we should 'let technical devices enter our daily life, and at the same time leave them outside'; the Amish take this advice quite literally when they leave their cellular phones in the outhouse overnight so that phone calls will not interrupt the face-to-face communal relations they cherish. The Amish do not reject new devices like the cell phone out of hand, but live reflexively with them, sometimes for years, before deciding 'what will build solidarity and what will pull them apart,' what can be adapted to fit the needs and values of their community (like high-tech electric barbecues) and what cannot (like cars), and in such adaptation they can be quite creative.²¹

But for Feenberg, Heidegger's faith in *Gelassenheit* is too 'nostalgic' (p. 199) and passive; Heidegger's 'fatalism' gives over too much human autonomy to the technological order. In fact, Feenberg's fundamental objection appropriates Marcuse's most powerful political criticism of Heidegger. As Marcuse put it, Heidegger succumbed to a 'hopeless heteronomism,' that is, he lost faith in the Enlightenment's understanding of freedom as the capacity for substantive rational self-determination, the ability to direct the ends as well as the means of human life. Feenberg expresses this Marcusean criticism in a Marxist register: Heidegger is a 'technological fetishist' (p. viii). In the Marxist vocabulary, fetishism occurs when a 'social relation between men' assumes 'the fantastic form of a relation between things.'²² For a Marxist (and let us not forget that critical theory is post-Marxian Marxism), to fetishize something is to detach it from the human labor that produced it but to continue nevertheless to project human meanings upon it, mistaking these projections for an independent reality. The fetishist's anthropomorphic projection endows a humanly created thing with the magical

appearance of possessing a telos independent of human ends. Heidegger's technological fetishism is visible in the fact that, in his view, 'technology rigidifies into destiny' (p. 14). But just as Feenberg downplays the active element in *Gelassenheit*, so here he overlooks the fact that for Heidegger enframing is our 'destiny,' but it is not necessarily our 'fate.' As Dreyfus puts it, 'although our understanding of things and ourselves as resources to be ordered, enhanced, and used efficiently has been building up since Plato and dominates our practices, we are not stuck with it. It is not the way things have to be, but nothing more or less than our current cultural clearing.' In fact, the critical force of Heidegger's 'history of Being' comes from his hope for a new historical beginning in which we would no longer treat everything as resources to be optimized.²³

Feenberg argues, however, that Heidegger succumbs to the 'deterministic illusion' because he fails to notice the 'specific technical choices' which are in fact always involved in processes like 'the deskilling of work, the debasement of mass culture, and the bureaucratization of society' (p. 11). If Heidegger 'allows no room for a different technological future' (p. 16), a future which would avoid 'the gloomy Heideggerian prediction of technocultural disaster' (p. 17), it is because he overlooks the specific choices that always go into the process of 'technological design,' and thus cannot envision the possibility that technologization could come to serve democratization. Again, I do not think Feenberg is right about Heidegger's supposed fatalism. This objection ignores Heidegger's hope for an 'other beginning' to Western history (this is not surprising, since for Feenberg the political direction in which this hope led Heidegger disqualifies the hope itself). Second, it rests on Feenberg's polemical characterization of *Gelassenheit* as 'Heidegger's outright rejection of agency' (p. 105). But, as Feenberg recognizes subsequently, Heidegger's more balanced insistence on ontological receptivity is in fact better understood as Heidegger's later 'corrective to his overemphasis on the role of *Dasein* in disclosure' in his early work (p. 195). For Heidegger it is crucial that we recognize our ontological receptivity if we are to get beyond our 'willful' technological ontology and envision an alternative future.²⁴ Still, Feenberg's conclusion—that Heidegger's own suggestions about this alternative future leave no room for a democratization of technology—is probably right for another reason, namely, Heidegger's excessively dim view of democracy.

At any rate, Feenberg's critique of Heidegger becomes the springboard for his own alternative, which seeks to expand democratic control over the technological design process. Here Feenberg again draws his inspiration from Marcuse. Unlike Heidegger, Marcuse learned from Hitler's rise to power about the importance of maintaining strong democratic institutions capable of mediating the will of the people and ensuring that the national voice is as inclusive as possible. Still, Marcuse was deeply concerned that the technological colonization of these democratic institutions discouraged rational autonomy. As Marcuse looked around himself in 1941, he saw that (p. I) "individualistic rationality has developed into efficient compliance with the pre-given continuum of means and ends.' Indeed, one revealing difference between Heidegger and Marcuse can be seen in Heidegger's interpretation of a massive highway interchange on the autobahn as a 'thing' capable of putting us in touch with the meanings of the world it embodies.²⁵ Pace Feenberg, here Heidegger recognizes that: 'Devices are things too' (p. 196), that is, he acknowledges that it is possible to attain a 'reflexive relation' to technological devices (p. 207). Heidegger thus helps raise the question concerning the world of meanings opened and transformed by technological phenomena such as the 'information

superhighway,' the internet.²⁶ Unlike Heidegger, however, Marcuse thought that: 'In manipulating the machine, man learns that obedience to the directions is the only way to get the desired results....There is no room for autonomy.' I think this shows that in fact Heidegger thought further in the direction of Feenberg's project than did Marcuse, even though this project is inspired by Marcuse's notion of a technological 'democratization of functions' (the only development Marcuse could point to within Western democracies that seemed capable of reversing our slide toward a 'totally-administered society').²⁷

IV. Feenberg's Alternative

Feenberg uses the work of Bruno Latour to uncover the way in which substantive political choices are embedded into technology during the design process. Think for example of the moral content locked into the 'technical code' of the 'speed-bump': rather than appealing to our rational autonomy through the imposition of speed-limits, the technical device simply decides for us and forces us to comply.²⁸ As Feenberg writes: 'Design comes to reflect a heritage of...choices. ...[I]n a very real sense there is a technical historicity; technology is the bearer of a tradition that favors specific interests and specific ideas about the good life' (p. 139). In short, technological 'design mirrors back the social order' (p. 87). Thus, against Heidegger's supposed technological essentialism, Feenberg argues that we need to recognize the historical 'malleability of technology' (p. 193), the possibility that technology could come to embody more democratic values. As an example of such technical historicity, Feenberg describes the struggle between IBM and Macintosh over text versus graphics user interfaces. Early on, the text-based interface nicely represented the values of computer users, who were mostly programmers. But as the democratization of computers spread computer use beyond programmers, the graphics interface came to better represent the values of the broader community of users.²⁹

Why is it then that when we look at today's computers, we see no sign of this struggle, which only recently ended? Feenberg's answer to this question explains why he thinks Heidegger missed what he missed. When the design process is complete, the value-laden choices that went into it are 'black-boxed,' sealed into 'the technical code' (p. 88). This hard-wiring of specific cultural values into our technical devices obscures the fact that these values were chosen, and this reinforces a fatalistic attitude toward technology. Such an analysis leads Feenberg to suggest that Heidegger falls victim to the 'deterministic illusion' technological 'closure' produces (p. 87) because he 'doesn't view modern technology from within' (p. 197). It is certainly true that Heidegger did not have much internal experience with technology (he did not own a television and wrote his more than one hundred book-length manuscripts all by hand; he would not even type, let alone 'word-process,' and it is not hard to imagine what he would have thought of the voice-recognition software Feenberg himself uses).³⁰ This becomes a decisive point for Feenberg, who concludes that Heidegger has unknowingly adopted the top-down 'strategic standpoint of the systems manager' rather than the bottom-up 'tactical standpoint of the human beings' enrolled within the technological network (p. 197).

Thus Feenberg responds to Heidegger with Foucault, supplementing the view from above with the 'view from below,' adding the perspective of the many 'subjugated knowledges that arise in opposition to a dominating rationality' (p. 8). Every program has its 'anti-program' (p. 119), Feenberg shows, because the dominating rational order

only comes into existence in opposition to a subjugated group.³¹ The hope for a democratization of technology is thus placed with such subjugated groups who, Feenberg convincingly argues, could increasingly come to intervene in the design process. Of course, to do so they must overcome the technocratic inertia produced by the vested interests embodied in the technical code (which, like Foucault's Panopticon, eliminates the need for someone to actually occupy the dominant subject position). Can Feenberg tell us how we are to do this? He should be able to, since he is so critical of the fact that Heidegger 'offers no criteria for constructive reform' (p. 189). In fact, there is a tension in Feenberg's positive view, which reflects the difference between the Marcusean and Heideggerian positions he has synthesized. He vacillates between an optimistic, Marcusean, May '68, 'Progress will be what we want it to be' view which exalts the human capacity to control our future through strategic interventions in the design process (p. 22), and a more pessimistic Heideggerian view which suggests that while we cannot directly control the historical direction in which technology is taking us, we can nevertheless impact the future in small ways by learning to recognize, encourage, and support technological democratizations when they occur.

But in the end, Feenberg's optimism wins out, and takes him beyond the alternatives envisioned by Marcuse and Heidegger. For Feenberg holds that '(p. w)hile the technocratic tendency of modern societies is no illusion, it is nowhere near as total as its adversaries once feared' (p. 104). The Birmingham School has taught him that the 'power structure of advanced societies' is 'a contestable "hegemony" rather than a "total administration"' (p. 106). In so far as the technocracy is not totalizing (as both Marcuse and Heidegger thought it would be), resistance to it need not take the utopian form of trying to transform the entire system at once. So Feenberg replaces Heidegger's epochal view of revolutionary historical change with a progressivist, evolutionary model. Clearly Feenberg does not like Heidegger's idea that we must wait for 'another God,' that is, a radically transformative cultural event which would successfully realign our values in one fell swoop.³² Yet here I can't help wondering, isn't 'May '68' the name for an event in which such a god seemed for a time to arrive? Feenberg's own project is certainly deeply motivated by the experiences of this event and the historical possibilities it revealed.

Feenberg nevertheless claims to be content to advocate an activism which is 'far more modest in its ambitions' (p. 104). He does not follow Marcuse's emphasis on possible resistances to technocracy which come from "'without" (art, philosophical critique, the instincts, the Third World)' (p. 107); rather, he advocates a progressive reform which taps into the 'radical political resources immanent to technologically advanced societies' (p. 108). Feenberg's goal is what he calls 'deep democratization,' that is, a short-circuiting of the administrative 'suppression' of resistances which would 'permanently open the strategic interiority to the flow of subordinates' initiatives' (p. 114). But Feenberg does not rid himself of all revolutionary ambitions; as he calls for the establishment of this permanent democratic voice in the design process, he situates his project within the broader movement known as radical democracy.³³ Feenberg's hope is that the proliferation of situated micro-struggles will eventually lead to a 'convergence' in which AIDS patients join together with environmentalists, Minitel hackers, progressive medical researchers, and the like, in order to form a 'counter-hegemony' capable of permanently democratizing technological design and so gaining some control over the historical impact of technology.³⁴ But if the goal is not simply democratic

control for the sake of control, if, rather, this endeavor is 'prefigurative,' that is, if its goal is 'to open up a possible future' other than enframing or technocracy (p. 108), then in the end Feenberg's powerful and important project may remain closer to Heidegger than his Marcuseanism allows him to acknowledge.[35](#)

Socially Constructed Technology: Comments on Andrew Feenberg's Questioning Technology³⁶

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Abstract

The main innovation in *Questioning Technology* is Feenberg's use of the results of various social constructivist accounts of science and technology to rethink the philosophy of technology. I agree with Feenberg that the social constructivist studies developed by historians and sociologists refute the essentialist account of technology that has been the mainstream position of philosophers of technology. The autonomy of technology seems to be nothing but a myth from the point of view of social construction, since social and political factors always influence decisions made in technology and science. However, there is a tension in Feenberg's position, in that he seems to want to keep the general analytical framework that the essentialist account of technology makes available, while at the same time rejecting essentialism and, indeed, showing forcefully how it gets in the way of the positive program he develops for democratizing technology. I argue that Feenberg should clarify what kind of social constructive account of technology he will adopt, and that the general categories for understanding technology that Feenberg retains are problematic. I conclude by arguing that a thoroughgoing antiessentialist philosophy of technology can still provide a general analysis of modernity and develop normative claims including those regarding social justice, without relying on general categories.

I. Introduction

The main innovation in *Questioning Technology* is Feenberg's use of the results of various social constructivist accounts of science and technology to rethink the philosophy of technology. I agree with Feenberg that the social constructivist studies developed by historians and sociologists refute the essentialist account of technology that has been the mainstream position of philosophers of technology. For example, Habermas's distinctions between system and lifeworld; technical and communicative rationality, etc. all seem to break down if technology and technological systems are socially constructed. The autonomy of technology seems to be nothing but a myth from this point of view, since social and political factors always influence decisions made in technology and science. However, far from limiting philosophical critique of technology, social constructivist accounts show that technology is open to criticism and to change. With examples developed here and in his earlier work, Feenberg shows convincingly that technology is open to social critique and that consumers, students, and workers have already had important impacts on the development of technology. Readers used to the pessimism of essentialist philosophy of technology may feel surprised, when reading

Feenberg, to discover that people have been successfully struggling against technology all along and have forced significant changes in the way technology is developed and applied.

There is a tension in Feenberg's position, however, in that he seems to want to keep the general analytical framework that the essentialist account of technology makes available, while at the same time rejecting essentialism and, indeed, showing forcefully how it gets in the way of the positive program he develops for democratizing technology (since a fixed essence would make it impossible to change technology). I will try to show that the general categories for understanding technology that Feenberg retains are problematic. Even though I have some reservations about the thoroughgoing antiessentialist, social constructivist position, I will defend it here for the purposes of discussion.

Embracing social construction could seem to eviscerate any possible critique of technology in several ways. In the last section of this talk, I will try to address these concerns. First, social constructive accounts may seem to be limited to descriptive accounts of the development of technology and may seem to be unable to make normative claims, if they are unable to use general philosophical concepts that describe the essence of technology. Second, if technology is controlled by contingent local conditions, it may seem that no one or no group really controls technology, so no one can be blamed for its negative consequences. Third, if there is no essence of technology, then it may seem that only studies of individual technological systems are possible, and critical analysis of the general meaning of technology will be lost. Feenberg is well aware of these problems and so does not embrace social construction fully. I will argue here that Feenberg should clarify what kind of social constructive account of technology he will adopt, and that an antiessentialist philosophy of technology can still provide a general analysis of modernity and develop normative claims including those regarding social justice.

II. A little sociology of the social construction of knowledge.

When Feenberg appropriates social constructivist accounts of technology, he ignores the varieties of positions in science studies. It is important to recognize that the current work of Bruno Latour, Michael Lynch, Andy Pickering, or Donna Haraway cannot be described as social construction. I limit my discussion to David Bloor and Bruno Latour, since Feenberg cites both, and since they had a recent exchange in *Studies in History and Philosophy of Science* that illustrates nicely what is at stake. Bloor wants to use social science as a tool to explain natural science and technology, while Latour, quite vocal in his opposition to social construction for quite some time, says that we cannot explain science and technology at all. Despite his protestations to the contrary, Bloor ends up reducing science and technology to a social phenomenon. Latour's motivation for adding non-human agents to his actor-network theory is precisely to avoid reducing science to a social phenomenon.

Feenberg is right that the central argument for the social construction of scientific knowledge has always been the underdetermination argument (the Duhem-Quine thesis) which supposedly shows that technology and science are never objectively justified, because there are always alternative theories that can be justified. I have argued elsewhere that all that follows from this argument is fallibilism, not relativism, but here I would like to simply point out the Feenberg does not follow the social

constructivist argument very far. His discussion is full of "constraint talk" as Andrew Pickering, who says he is allergic to "constraint talk", would say. For example, Feenberg discusses the "positioning" of technologies (p. 204-5), giving examples of all of the laws that different technical spheres posit in order to circumscribe their actions: "The laws of combustion rule over the automobile's engine as the laws of the market govern the investor (Feenberg, p. 204). These "laws" might be scientific, but they also might be something like deep public attitudes, which advertisers must work with rather than against, or in the case of management, assumptions about the psychology of workers" (Feenberg, private correspondence). This seems obviously correct, but also quite contrary to social construction, at least as developed by Bloor, since choices are not really very open to those developing or expanding technologies. According to Bloor, we can always develop an alternative which ignores the constraint. Of course, Feenberg's view on these matters seems very close to that of Bijker, T. P. Hughes, and other historians of technology, as well as Latour, and no wonder, because it is apparent to me that Latour has followed these authors in developing the idea that there are multiple constraints on the development of technology and science, some of them social, some of them intrinsic to the science involved, some of them economic, etc.

III. Having your essentialism and avoiding it too.

Just as Feenberg does not fully adopt social constructivism, neither does he adopt antiessentialism entirely, as is indicated by several passages in the book where he concurs with essentialist critiques of technology. In chapter nine Feenberg develops a positive program for the analysis of technology that incorporates both general and concrete analysis, thus synthesizing philosophical essentialist and concrete, particularistic accounts of technology that have been developed under the banner of social construction.

Feenberg develops this difference between the general properties of technology and its specific applications as "primary and secondary instrumentalizations". His idea is to give general characteristics of technology under the primary instrumentalizations and then offer a schema for the characteristics of technology that appear when technologies are actually developed and implemented. By my lights, the primary ones are problematic, since to even begin such a general analysis, one must assume that one can meaningfully discuss technology in general, that there is one process that takes place in all technology, and this seems to assume an essence of technology. "The primary instrumentalizations are intended to outline the basic conditions of the type of objectification and subjectification involved in the technological relation to the world" (Feenberg, private correspondence).

The four elements of primary instrumentalization are Decontextualization, Reductionism, Autonomization, and Positioning.

1) Decontextualization: Heidegger and other essentialists have often said that technology tears objects from their meaningful context and shows them as a resource. The tree loses its place in the forest and is seen as lumber. However, the lumber would not exist qua lumber without carpenters and the housing market, so objects are always recontextualized in a new social setting and there are really no decontextualized objects at all, any more than there is disembodied objective knowledge. This is another myth that positivists have promoted about technology and that antitechnology essentialist philosophers have mistakenly accepted. The social construction of technology gives us a

better account. Elsewhere, Feenberg seems to acknowledge the idea that everything is always in a social context (p. 205).

2) Reductionism: Feenberg says that technology reduces things to their primary qualities. Generally, this is said only of the exact sciences such as mathematical physics, although the idea could be generalized to other sciences if he means that you discover the objective (i. e. scientific) reality of things in science. Yet, this very notion assumes there is an objective, scientific essence of things. In fact, things only seem to be reduced to their primary qualities when their social relations are ignored.

3) Autonomization: Technology is designed to create autonomous decision making, but Feenberg's examples of successful democratic resistance to technology show precisely the limits of this autonomy. The French technocrats had to pay attention to the uprising of 1968; they did not maintain their autonomy.

4) Positioning: I have already argued above that Feenberg's discussion of positioning flies in the face of social constructivist accounts, especially the underdetermination argument that Feenberg endorses.

Secondary instrumentalization, subtitled realization, relates to how technology is put into concrete practice and again has four aspects: Systematization, Mediation, Vocation, and Initiative. Under mediation, Feenberg says that industrial objects do not have a style, that style is added afterwards. On the contrary, it is very important to recognize that technology does have an aesthetic style—a new, technological style. The Logical Positivists had an antiphilosophical philosophy and the Bauhaus had an antiaesthetic style, but a style nonetheless (Galison, 1990). A few pictures would make the point better than any words, but a slogan will do almost as well. Among the photomontages at the International Dada Fair in Berlin in 1920 is a poster that reads "Art is dead. Long live Tatlin's new machine art." As Feenberg says under his discussion of Vocation, the technological world does add up to a life, it is not autonomous and nonhuman.

IV. The complete antiessentialist

Above I listed three ways in which an antiessentialist account of technology may seem to be lacking critical force. I will now argue that each of these issues can be successfully addressed by an antiessentialist.

1. Can social constructivist accounts of technology be normative?

It is often thought that a local, nontheoretical analysis will be inadequate to ground a critical stance toward technology and science, that local knowledge can only be descriptive. This assertion is based on a commitment to a foundationalist model of grounding. As Callon and Latour have emphasized, the lesson to learn from the demise of intellectual history is that connections between historical players and ideas must be shown in the local setting. However, analyses are as large as they are made. If one can find a way to make connections between disparate events, one will have an extended analysis, even while meeting the requirements of an empirical, local study. There is no a priori limit to the size of the analytical network created, rather, one must test the limits of the tools of local, concrete case studies. Extending this idea to the political consequences of an analysis of technology with the tools of social construction, we see that there is no limit to the critical force of an analysis. The political force that a local analysis will have is a practical, concrete question, not an abstract issue of grounding. To make one's position critical and to have an effect, one must muster allies, be read, cited,

and so on, and make a practical difference (Stump, 1996, p. 285; Callon and Latour, 1981).

2. Who is in charge?

Feenberg appeals to essentialism in order to assign blame to those in charge of technology: "There are, as essentialists argue, technological masters who relate through rational planning to a world reduced to raw materials. But ordinary people do not resemble the efficiency oriented system planners who pepper the pages of technology critique" (Feenberg, 1998, p. x).

Individuals and classes do have very different positions in modern technological society, but no one is "in charge," a point made most forcefully by Foucault. The Panopticon works even when no one is in the guard tower, and even more to the point, those who are in the guard tower are just employees as well. Even great corporations have to please the economic market, individual consumers and get the nonhuman actors to cooperate. The present of technological masters is not necessary to critique technology since even if no one is in charge, some actors still benefit more than others (consider the average CEO salary in America), which is enough to raise issues of social justice.

3. If technology is not autonomous, what defines modern rationality?

Like Feenberg, I keep a general analytical framework, despite my antiessentialism. I especially want to retain the Weberian analysis of modernity as differentiation, which has been not only influential, but also very fruitful. Feenberg notes that social constructivist accounts seem to be inconsistent with the idea of differentiation. "But if technology is so profoundly embedded in the social, differentiation must be far less thoroughgoing than essentialist theories of modernity assume" (Feenberg, 1998, p. 210).

I am not sure that this is true, though it certainly sounds plausible on first hearing. But what Weber said when he introduced the idea of differentiation as essential to modernity is not necessarily incompatible with the social constructivist account. According to Weber, the Enlightenment project of making individuals and society rational has led to each "sphere of value" running by its own rules and aims. Therefore, modern politics is separated from religion, modern scientific knowledge follows its own methods and studies everything without being concerned with consequences, and a modern free market follows the laws of supply and demand without "artificial" limits on growth, profit or loss, etc. Weber's basic idea is that progress has occurred as people moved away from personal connections to impersonal ones. Early societies were based on family and tribal relationships that were then replaced by the "ethic of brotherliness", while in modern society we have completely abstract, impersonal relationships, at least in the public spheres.

". . . the rationalization and the conscious sublimation of man's relations to the various spheres of values, external and internal, as well as religious and secular, have then pressed towards making conscious the internal and lawful autonomy of the individual spheres; . . . This results quite generally from the development of inner- and other-worldly values towards rationality, towards conscious endeavor, and towards sublimation by knowledge" (Weber, p. 328).

The idea of a totally value-free technology is a myth, as social constructivists have argued, but that does not mean that the Weberian analysis of modernity is wrong. Technology (and the economy, and politics) really have become autonomous in the modern era, relative to their position in the pre-modern eras, but what this means is

that new values have replaced the old values, new values that make a pretense of value-neutrality and objectivity. We can see this process clearly in the Machine Art mentioned above. Aesthetics is not removed, but rather transformed into a machine aesthetic. Similarly, when social constructivists say that technology is political, they do not mean that it is a representative democracy, but rather that human interactions are essential to technology. Feenberg's emphasis on developing a new type of politics in response to technology is thus exactly on target.

I think Feenberg is also on the right track in seeing the development of technology and modernity as historical. We agree that a historically coherent set of practices can legitimately be called modern technology. So what is the difference between an essentialist understanding of technology and a historical one? First, a historical conception does not support teleology—the development of technology is contingent. Beyond these points of agreement, I argue further that we can still use the Weberian analysis of modernity with antiessentialist, local studies of science and technology.

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Constructivism and Technology Critique: Replies to Critics

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Abstract

1. Thomson's critique: Despite the efforts of his followers to show that Heidegger had a progressive theory of technology, his work is clouded by nostalgia. His positive contribution is a fragmentary opening toward a phenomenology of daily technical practice, which I use to develop de Certeau's distinction between the strategic control of technical systems and their tactical usage by subordinates. Heidegger himself made no such application of his own phenomenological approach. 2. Stump's critique: Can an ontological essentialism and a historically oriented constructivism be combined as Questioning Technology attempts to do? Stump claims they cannot, but assumes that I accept far more ontological and epistemological baggage from each position than I do. In fact what I retain from essentialism is primarily the analysis of the basic technical relation to reality, and from constructivism, historical and hermeneutic methods of analysis of the realization of that relation in actual systems and devices. These elements of the two theories are compatible.

I. Heidegger or Marcuse...or both

I want to thank Iain Thomson for his generous and lucid explanation of some of the more obscure aspects of my book. The historical background he offers is accurate and useful, and I can agree with most of his interpretation of my contribution. It is true that I am deeply influenced by both Marcuse and Heidegger and that is something of a paradox given their quarrel. I have two points I want to make here in response to Thomson, and I will make them as briefly as I can since I have far more disagreements with David Stump to deal with in the second part of this talk.

My first concern has to do with Thomson's attempt to portray Heidegger as a non-essentialist thinker with a historical theory of technology that can guide us today. I am not surprised that Thomson, who studied with Hubert Dreyfus, should come to the defense of Heidegger. Dreyfus himself has written several interesting articles in which he attempts a similar salvage operation. Like Dreyfus, Thomson refers us to a passage in Heidegger's essay, "Building Dwelling Thinking," where the modern highway bridge functions as a "thing" in Heidegger's eminent sense of the term (Dreyfus, 1995: 102-103). It is true that in this passage Heidegger discusses modern technology without negativism or nostalgia and suggests an innovative approach to understanding it. Combining this unique example with his many obscure and ambiguous statements on technology in general, one can construct connections between Heidegger and Woodstock, as does Dreyfus, or, more plausibly, Heidegger and the Amish, as Thomson suggests here. But how plausible are these interpretations, really?

I will admit to having learned something from looking at Heidegger in this way. His phenomenology of action suggests an understanding of technology as a lifeworld rather than a mere instrumental means, and this is a valuable contribution. There is something right about the notion of *Gelassenheit* too, freely interpreted. As a result I do not condemn Heidegger absolutely as do many critics of his awful politics, and I have tried to make use of certain aspects of his thought in my own questioning of technology. But I am always held back from full assent to these redemptive views of Heidegger by two other aspects of his thought.

On the one hand, his defenders have to admit that the famous highway bridge passage is the one and only instance in his whole corpus of a positive evaluation of a modern technology. Alongside this passage, there are dozens of others that reek of volkish nostalgia for the good old days of thatch roofed huts, silver chalices, quill pens, humble jugs, wooden shoes, and suchlike trappings of the elitist anti-modernism of right wing German intellectuals in the Weimar and Hitler period. There is even an amusing passage in the Parmenides lectures where Heidegger attacks the typewriter for alienating the hand from the word, apparently to the amusement of his students whom he asks for forbearance. (Thomson discusses this passage and tries to find in it an anticipatory critique of word processing. I am not persuaded.)

I believe that this is not merely a nervous tic of an old mandarin, but theoretically significant. Its significance lies in the fact that one finds no criteria for the transformation of modern technology anywhere in Heidegger. Despite all the efforts to complicate the picture with learned reflections on the word *Wesen*, the fact is that Heidegger envisages only three ways of making things, art, craft, and modern technology, and his critique of the latter for challenging nature and storing up its powers implies that almost everything we associate with industrial society is bad. This was a common view in Heidegger's conservative academic milieu, as Hans Sluga convincingly argues, and Heidegger fits right in (Sluga, 1993). This is not to reject out of hand attempts of Heideggerians such as Thomson to develop a philosophy of technology based on Heidegger, but it does suggest that they ought to admit the extent of their own originality with respect to the master. What they would lose in borrowed authority, they would more than regain in plausibility.

On the other hand, there is Heidegger's peculiar fidelity to the Nazi response to what he called "the encounter between global technology and modern man" (Heidegger, 1961: 166). His last word on the failure of the Nazi's in his final interview was to dismiss them as "far too limited in their thinking" to understand and fulfill the promise of their own revolution (Heidegger, 1977). Thus Heidegger maintained a position on Nazism in some ways parallel to Marcuse's on communism: the revolution betrayed (in Germany, in Russia) was not the real revolution which we still await. There are of course differences. The Heideggerian "revolution" no longer had any political content after his brief experience in politics. And, there are controversial but intellectually respectable reasons for believing that Marcuse's revolution would be worth waiting for while it is incomprehensible how any intelligent person could continue to maintain even so much as a critical relationship to Nazism after World War II.

These reservations about Heidegger bring me to my second point. This has to do with a difference between my theory of technology and that of both Heidegger and Marcuse. Here a little personal history may be useful. In 1965 when I arrived in La Jolla to study with Marcuse, the New Left was still a very small phenomenon. Most criticism

of American society was cultural criticism, much influenced by the Beats and Zen, or by the cultural elitism of intellectuals appalled at television and rock music. In this situation political revolution of the traditional kind seemed even more implausible than it does today. To give you a little sense of perspective, Alexander Juutilainen, a film student at Marcuse's home campus of the University of California, opens his recent documentary on Marcuse's role in the period with newsreel shots of "Marxist Marcuse" hanged in effigy by the American Legion from the flagpole in front of the San Diego City Hall. Proletarian revolution was clearly not on the agenda. Marcuse's theory reflected this failure of the dialectic, the Marxian notion that capitalism was fraught with internal tensions between workers and capitalists.

Nevertheless, it was possible to sense tremendous tensions in this very conformist society, and those tensions did finally explode the cozy world of the 1950s. The question was, what did those tensions mean, from what sources did they emerge, what was their object and destiny? Many of us who were living those tensions had a different answer from Marcuse. He followed Heidegger more than he admitted to himself and to us in holding that the one-dimensional technological universe of advanced industrial society was a closed or nearly closed system in which opposition was impossible or nearly impossible (Marcuse, 1964: xlvi). When he began to see evidence of widespread opposition, he theorized it as a new dispensation (Heidegger would have said "revealing") coming from a source external to the society itself, the instincts.

But to us it seemed that this theory was much too negative and unhistorical. As we created movements against the War in Vietnam and engaged in student protest, we felt that our actions reflected internal tensions within one-dimensionality itself and not an external intervention from a transcendent source outside the society. But how to explain these new tensions without relinquishing Marcuse's insight into the integration of society and returning to a discredited Marxist concept of proletarian revolution?

I recall writing a long essay for Marcuse in 1966 called "Beyond One-Dimensionality" in which I tried to show how a one-dimensional society could yield up a new dialectic.³⁷ Although my current work on technology is quite different from this early effort, the pattern is similar. I am still looking for a way of identifying and explaining internal tensions in a one-dimensional technological universe. The account offered in *Questioning Technology* involves a phenomenology of the technical lifeworld, and so is dependent on Heidegger as Thomson shows.

In the book I argue that technology is a two-sided phenomenon: on the one hand there is the operator, on the other the object. Where both operator and object are human beings, technical action is an exercise of power. Where, further, society is organized around technology, technological power is the principle form of power in the society. One-dimensionality results from the difficulty of criticizing this form of power in terms of traditional concepts of justice, freedom, equality, and so on. But the exercise of technical power evokes resistances of a new type immanent to the one-dimensional technical system. It is here that we can hope to find an explanation for internal tensions.

For my account of these tensions, I rely heavily on the work of Michel de Certeau (De Certeau, 1980). De Certeau offered an interesting interpretation of Foucault's theory of power which highlights the two-sided nature of technology. He distinguishes between the strategies of groups with an institutional base from which to exercise power and the tactics of those subject to that power and who, lacking a base for acting continuously and legitimately, maneuver and improvise micropolitical resistances. It is important to

note that de Certeau's theory of strategies and tactics does not personalize power as a possession of individuals but articulates the correlation of power and resistance in Foucault. It works remarkably well as a way of thinking about immanent tensions within technology.

Technological systems impose technical management on human beings. Some manage, others are managed. These two positions correspond to the strategic and tactical standpoints in de Certeau. The world appears quite differently from these two positions. The strategic standpoint privileges considerations of control and efficiency and looks at the world in terms of affordances, precisely what Heidegger criticizes in technology. The tactical standpoint is far richer. It is the everyday lifeworld of a modern society in which devices form a nearly total environment. In this environment, the individuals identify and pursue meanings. Power is only tangentially at stake in most interactions, and when it imposes itself, resistance is temporary and limited in scope by the position of the individuals in the system. Yet insofar as masses of individuals are enrolled into technical systems, resistances will inevitably arise and can weigh on the future design and configuration of the systems and their products.

This two-sided interpretation of technology opens up a theory of technical politics better able to give insight into the contemporary world than anything in Heidegger or Marcuse. My most basic complaint about Heidegger in my book is that he adopts unthinkingly the strategic standpoint on technology. He sees it exclusively as a system of control and overlooks its role as a lifeworld. This is what leads him to such negative judgements and what ultimately explains his hope that Nazism could, by mysteriously transforming our relation to technology from above, fulfill his program. Instead, I urge a democratic transformation from below.

II. Constructivism or Essentialism...or a little of both

I would like to turn now to David Stump's paper.

I stand charged by Stump with being a Janus-faced critic of technology. My essentialist face looks backward toward the old-fashioned approach of Heidegger and Habermas, while my constructivist face looks forward toward current science studies. I appreciate his attempt to straighten out the relation between my two faces. Of course he is right that there's a problem here. We differ in that I believe it's a real problem and not merely a personal confusion. The question is, can I convince anyone else of this intuition. You will have to judge.

As Stump points out, I do not belong to any particular school of thought in the general trend loosely described as "constructivist" by outsiders. The internal disputes among these scholars have absorbed them for a decade, but are lost on their critics who lump them all together as relativists mainly because none of them are realists in the usual sense of the term. I too am guilty of lumping different schools of thought together, but for a different reason. I do not borrow the epistemological and ontological arguments about science of Pinch, Bijker, Latour, Law and their colleagues, but recast various approaches explored in their work as keys to a historical hermeneutic of technology. By this I mean that what interests me is the tools they give us for interpreting technology and its place in the social world. Some of these tools enable us to demystify the strategic standpoint on technology, while others are useful in articulating the daily reality of a technological society as it is experienced by ordinary people.

For example, the constructivist concept of "interpretative flexibility" was introduced originally to discuss the ambiguity of observational data, but then generalized by Pinch and Bijker to refer to the ambiguity of function of technological devices (Pinch and Bijker, 1989). In this latter usage, it can explain the fact that a device with a single name, such as a bicycle, can have entirely different functions and corresponding designs for different groups of users. It is this latter application of the concept of interpretative flexibility I appropriate from constructivism. Technocratic claims based on "technical necessity" can be challenged from this standpoint.

Similarly, Latour has introduced the concept of the "delegation" of norms to devices as an example of his ontological requirement of a "symmetry of humans and non-humans." Latour claims that values inhere not only in people's minds but can also be found literally "in" technological artifacts themselves. Thus in one of his essays, he argues that the norm "Close the door" can be realized either in a moral command or in a device that automatically closes the door (Latour, 1995). What interests me in such examples is not Latour's general symmetry thesis but more simply the method he offers us for interpreting norms as intrinsic to technologies, as "delegated" to them, and hence as dimensions of everyday technical life.

These considerations are relevant to several of Stump's objections to my use of constructivism. Stump appears to believe I borrow more than I do and thus fall into various contradictions, when in fact my borrowings are purposely limited precisely to avoid just the sort of problems he identifies. For example, Stump argues that I have strayed from the fold in talking about constraints on technology rather than confining myself to local empirical analyses, and he objects to my reference to inequalities of power in the technical sphere.

It is true that I do not agree with some constructivists, such as Pickering, that technological choices are absolutely open and unconstrained. Pickering supports this odd view by arguing that in any specific instance knowledge of supposed limitations would itself be relative to the unfolding of the practical case in point and confirmed only after the fact (Pickering, 1995: 206ff). This astonishing argument would gratify David Hume but it makes mincemeat of social knowledge. I think "constraint talk" is inescapable in the real world of technology where money, power, laws, markets, available resources and the prejudices of technical experts all weigh far more heavily on choices than other factors such as democratic public debate, moral values, and the interests of the weak and disenfranchised. This is surely true, or anyway what we must use for truth, however uncertain our knowledge and even as the relative influence of various factors is tested in case after case. Pickering's problem is that his interesting epistemological critique of objectivism ends up justifying an implausible ontological scepticism. That seems a defect in his argument rather than a recommendation. I would like to be able to draw on practice oriented analyses without paying such a steep philosophical price.

I would agree with the narrower point Stump makes, following Bloor, that there are often alternatives that get around the obvious constraints. In fact I spent a good deal of effort in the book showing how this fact refutes old-fashioned technological determinism and the social policies that depend on it. Is voluntary poverty the only alternative to nuclear power? Must we use dangerous pesticides or go hungry? I answer "no" to these questions for reasons of principle I explain in chapter 4. But that is hardly the same thing as denying the very existence of constraints! And as Stump points out,

my view on this question agrees with that of some other constructivists, for example Latour, Pinch and Bijker. This is good enough for my purposes.

Stump also claims that a purely local analysis of specific cases can be extended to any level without requiring theory. I am puzzled by this claim. If the local analysis is sufficiently extended, does it not become nonlocal, indeed theoretical? Why not just generalize from local examples to macro categories and theories? We have already seen one reason in the discussion of Pickering's Humean scepticism regarding constraints. Latour has equivalent arguments of greater generality.

Thus although Stump's empiricist preference for the local sounds innocent enough, truly rigorous localism excludes all reference to the traditional categories of social theory, such as class, culture, the state, and so on. For Latour, for example, the analysis of networks suffices, and the introduction of these macro-social terms would simply mask the activities of the underlying actants which establish them in the first place (Latour, 1984: 222-223). I owe a considerable intellectual debt to Latour, but I cannot follow him all the way to a pure localism of this sort. Denying all relevance to the generalities of traditional philosophy and social science reminds me too much of the positivism I resisted in my youth (Rouse, 1996: chap. 4).

Stump may be right that deep political consequences flow from the Latourian method, but I have not yet seen enough evidence to be convinced.³⁸ On the contrary, Law's famous network analysis of Portuguese navigation is widely criticized for ignoring the fate of the conquered peoples incorporated into the colonial network, and critics such as Hans Radder argue that Actor Network Theory contains an implicit bias toward the victors (Law, 1989; Radder, 1996: 111-112)). I address this problem in chapter 5 of my book and attempt to solve it by introducing what I call the "symmetry of program and anti-program."

This leads me to the issue of power, which is central to my analysis of the politics of technology. Stump claims that assigning responsibility for technological decisions violates Foucauldian methodological principles according to which no one is in charge, the Panopticon is empty. It is true that Foucault claims that modern power takes the form of a system which incorporates the agents and assigns them roles. But this is only half the Foucauldian story as I argue on the basis of de Certeau's interpretation of Foucault.

There are two problems with stopping halfway, as I think Stump does. First, if one totally depersonalizes power one ends up with a very old-fashioned deterministic theory. Jacques Ellul, for example, regards technological decisions as governed by a system logic so rigid it does not matter who makes them (Ellul, 1964: 74). Can a constructivist agree? Surely, if there really are actors they must introduce a significant degree of contingency into development. For my second objection, I refer you to what I have said above about de Certeau's interpretation of Foucault. On that account, one needs to reconstruct, not reject, the concepts of the powerful and the weak, the responsible agent and the victims. Were this not the case, Foucault's own political practice on behalf of prisoners would be incomprehensible.

So much for Stump's critique of my constructivism. He has even more serious problems with my essentialist face. Just as I attempt a hermeneutic appropriation of constructivism, so I try to reconstruct certain essentialist insights in the same spirit. I do not want to make claims in some Heideggerian or worse yet realist ontology, but I do want to show how essentialism can help us interpret some aspects of technology. But

Stump reduces my ideas on this score to one or the other ontological position. Answering his objections may help me to clarify my own argument which I admit is difficult because of the unfamiliar way in which I use familiar concepts.

As Stump notes, in chapter 9 I distinguish a primary from a secondary instrumentalization. I consider these two analytically distinguishable aspects of technology and say as much on p. 205: "The primary instrumentalization lays out in skeletal fashion the basic technical relation. Far more is necessary for that relation to yield an actual system or device: technique must be integrated with the natural, technical, and social environments that support its functioning." Let me try to explain what this means.

What I call the primary instrumentalization is the technical orientation toward reality, what Heidegger might call the technological "mode of revealing," or Habermas an objective "world relation" to the natural world. I describe this orientation as it reflects functionalizing dimensions of the technical object and subject. There is no question here of a realistic ontology in which these dimensions would be taken as a description of the really real. Yet they are not fantasies, obviously, or there would be no effective technologies.

In Heidegger and Habermas, the "technical" is identified with what I call the primary instrumentalization, that is, with a certain orientation toward reality. I argue on constructivist grounds that this is a very incomplete definition. The technical involves not just an orientation but also action in the world, and that action is socially conditioned through and through. Hence the need for a theory of secondary instrumentalizations through which the skeletal primary instrumentalization takes on body and weight in actual devices and systems in a specific social context.

It has occurred to me reading Stump's critique that there is a simple analogy with literature that might help to explain why I consider these two levels together to form a single "essence." It is obvious that literature depends on the imaginative capacities of human beings. Yet it is equally obvious that a definition of literature which included only those capacities would be incomplete. What about genres such as the novel or tragedy? What about composition and performance? Markets and careers? Surely all this belongs to literature too. The essence of literature must include a reference to imagination, to be sure, but it must include a lot more as well, and this carries us into social territory we must explore if we really want to understand literature.

Technology seems to me to be a precisely parallel case. A complete definition must show how the orientation toward reality characteristic of technology is combined with the realization of technology in the social world.

Another simple example can illustrate this point. Carpentry involves perceiving wood as a resource and grasping the affordances it offers. In phenomenological language, we could say that the world reveals itself to the carpenter as such a resource, as such affordances. Without this primary instrumentalization of wood, no one would have thought to make Heidegger's famous hammer, but a hammer is not just an "application" of a technical orientation toward wood. Rather, it is a concrete object produced in a specific society according to a complex social logic. To understand the form of the hammer, its manufacture, its symbolic status, and so on, we need a lot more than a theory of technical orientation. Furthermore, a theory of technical orientation will not tell us what becomes of persons whose lives are dedicated to working wood, how that activity will shape their hands, their reflexes, their language and personality so that

we will be right to say, "He or she is a carpenter." All these are secondary instrumentalizations, inseparable from the essence of technology.

My intent in analyzing technology at these two levels was to combine essentialist insights into the technical orientation toward the world with constructivist insights into the social nature of technology. In the process I have tried to show that what are usually presented as competing theories are in fact analytically distinguishable levels in a complex object. But Stump takes my analytic distinction and interprets it as a real distinction. As a result my position collapses back into the two separate positions from which it was extracted.

Chart I

Functionalization Realization

Objectification decontextualization systematization
reduction mediation

Subjectivation autonomization vocation
positioning initiative

For example, the primary instrumentalization includes "decontextualization," a Heideggerian category. Stump points out that from a constructivist standpoint the tree which is decontextualized in being torn out of the forest and treated as lumber is immediately recontextualized in the realm of carpentry. But I say nothing else! Corresponding to decontextualization, there is a secondary instrumentalization, "systematization." Under that heading, I write, "To function as an actual device, isolated, decontextualized technical objects must be combined with each other and re-embedded in the natural environment (p. 205)." The question is not whether I know this fact about technology, but whether it is worth distinguishing the two "moments" of decontextualization and recontextualization, and if so how they should be related.

Perhaps the confusion results from my use of the word "object" to define the decontextualized elements. A pure technical element such as the wheel is an object only in the same abstract sense we call ideas or numbers objects. A technically oriented human presumably found the decontextualized idea of the wheel long ago in looking at something like a fallen tree trunk roll. An actual usable wheel is a real thing we have to make in a concrete social context but that is something we can only do because we are capable of "finding" wheels in the world. The distinction and relation between these two dimensions of the technical seems to me fundamentally important.

Throughout Stump's account of my argument the same problem arises. Look at his critique of my notion of reductionism. I claim that the primary instrumentalization not only decontextualizes but also reduces the object to "qualities of primary importance to the technical subject (p. 203)." Stump seems to interpret this metaphoric reference as a standard Lockean claim that primary qualities in my usage of the term are ultimately real. But my intent was to develop a similarity between what Callon calls the

"simplification" of network elements and the Heideggerian enframing (Callon, 1989).
Ontological realism was the furthest thing from my thoughts!

Once again, the primary instrumentalization, reduction, works closely with its corresponding secondary instrumentalization, mediation. Mediation refers to the inevitable reconstitution of technical objects as value-laden, as ethically and aesthetically formed, in the course of their actual production. So, I do not say that the reduced objects can be released value free on the world. On the contrary, the reduction takes place at the level of the orientation of the subject and reveals an aspect of reality. It is a long way from there to an actual technology, and along that way devices take on an aesthetic form and values are delegated to them.

This brings me to another of Stump's criticisms. He understands my discussion of mediation to imply that industrial objects are aesthetically value neutral in that they have no style. This has to do with a further and daunting complication in the argument as it relates to the concept of the differentiation of modern societies. I concur with Stump's description of this concept. Differentiation is a way of talking about the liberation of scientific-technical rationality and institutions from religion and other social involvements. I note that this is reflected in the apparent value-neutrality of technologies. It is a fact that in modern societies the technical sphere is sometimes subjected to ethical and aesthetic mediations from without, from government for example, or a design department staffed by non-engineers, even by artists. The exogenous source of these values is usually understood to imply the value neutrality of technology itself. Stump objects to my reference to these facts on the grounds that even pure industrial design embodies values, the values particular to the technical sphere itself, and this shows up in what he calls a "machine aesthetic."

I think it is clear that I do not share that view that technology is value neutral so I take it Stump is trying to point out an inconsistency in my argument. But in fact the issue that concerns me in the passages that worry him has to do with the way in which values enter and are incorporated into the social world of technical production. On these terms, a "machine aesthetic" internal to scientific-technical rationality seems to me to concede far too much to the notion of the autonomy of technology. My book argues at some length against the idea of a pure scientific-technical rationality that would have its own value sphere. To this notion, I oppose the idea that real scientific-technical rationality, the kind that has effects in the world and not just in the heads of philosophers, exists in the form of social institutions and technical cultures and, as such, it is inherently impure. In fact, the last chapter of my book is entitled "Impure Reason" (with apologies to Steven Epstein whose *Impure Science* (1996) suggested the play on words.)

If we can follow Weber in talking about the differentiation of this "real" rationality, that is not because it is truly neutral but because of the subtle way in which it assimilates and metabolizes the social. In traditional societies, values are imposed from the outside as the commands of value-bearing institutions like Churches and governments, and that is that. Artisans are generally conscious of this extrinsic source and see what we would consider arbitrary constraints as granting the supreme sanction and meaning to their technical achievements. But modern technology quickly transforms such extrinsic constraints into taken-for-granted internal technical specifications that determine technically rational designs. The sidewalk ramp is an obvious example. Imposed by law on behalf of the handicapped, it is now a technical specification for sidewalk

construction. In building a sidewalk today, one need not worry about the politics of how it became such, nor even know its original purpose. A similar correlation of technical rationality and social amnesia can be found in every technical domain.

This complicates the theory of mediation in modern societies and I think this is what has caused Stump to misinterpret my argument. I tried to clear this up with a chart on p. 221 which shows that differentiation sometimes yields institutional separations between, for example, technical work and value considerations, but at other times condenses the two in the technical code that governs the work. I call this condensation, "concretization," following Gilbert Simondon (Simondon, 1958: chap. 1). So, a less polluting car is made at first by slapping a device on the tailpipe, and here we have an obvious instance of an application shaped by exogeneous pressures. And yet ten years later when you look at the engine you find it has been completely redesigned, with fuel injection, a requirement for new kinds of gasoline, etc. Now it completely internalizes the environmental constraint and links it to the achievement of other objectives such as fuel efficiency. Pollution control is no longer just another application tacked on in response to political pressures; it has become a standard way of building an engine. Here values are internalized as technical choices.

So what values belong to the technical in a differentiated modern society? Any values that end up being incorporated into the dominant technical codes. Certainly not values somehow specific to a science and technology differentiated from other spheres. This has important political implications because it means that technology and values are not substantial "things" belonging to separate spheres and related only externally. That is the view we hear in the typical conservative argument according to which morality and efficiency must be traded off against each other in cases such as environmentalism or worker democracy or a dozen other similar issues. I cannot now explain further how I develop my position, but it should be clear that it does not imply the value neutrality of technology.

Let me sum up here in conclusion. I believe that both essentialism and constructivism have something to contribute to our understanding of technology. Hence my Janus-faced approach. The problem is to combine their insights in a theory that bridges the conceptual gaps between traditions and the cultural gaps between their practitioners. I have tried to make a contribution to this task with my book. I want to thank Thomson and Stump for provoking me to clarify my thought further with these remarks.

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[1](#) Andrew Feenberg, *Questioning Technology*. London and New York: Routledge, 1999, xvii+243 pp., pb. \$24.95. Unprefixed page references are to this work. An earlier version of this paper was presented at the Society for Philosophy of Technology conference in San Jose, CA, on July 16, 1999. I would like to thank Bert Dreyfus, Jerry Doppelt, Andy Feenberg, Wayne Martin, David Stump, and Richard Wolin for helpful comments and criticisms.

[2](#) Richard Wolin, ed., *The Heidegger Controversy* (New York: Columbia University Press, 1991), p. 152.

[3](#) See Douglas Kellner, *Herbert Marcuse and the Crisis of Marxism* (London: Macmillan, 1984), pp. 480-97; and Rolf Wiggershaus, *The Frankfurt School: Its History, Theories, and Political Significance*, trans. M. Robertson (Cambridge: MIT Press, 1995), pp. 95-104.

[4](#) Herbert Marcuse, 'The Struggle Against Liberalism in the Totalitarian View of the State' (1934), *Negations: Essays in Critical Theory*, trans. J. J. Shapiro (London: Free Association Books, 1988), p. 41.

[5](#) Marcuse, *Reason and Revolution: Hegel and the Rise of Social Theory*, 2nd ed. (New York: The Humanities Press, 1954), p. 170; *ibid.*, p. 180; Franz Neumann, *Behemoth: The Structure and Practice of National Socialism, 1933-1944* (New York: Oxford University Press, 1942 and 1944), p. 470 (Marcuse clearly shared Neumann's view; see Kellner, 'Technology, War, and Fascism: Marcuse in the 1940s,' in Herbert Marcuse, *Technology, War, Fascism*, Kellner, ed., (p. London: Routledge, 1998), p. 8); Marcuse, *Reason and Revolution*, p. 419 (Schmitt, of course, was celebrating rather than bemoaning this fact; see Marcuse, 'The Struggle Against Liberalism in the Totalitarian View of the State,' p. 275, note 79).

- 6 Adorno's May 13, 1935 letter to Horkheimer is quoted by Kellner in 'Technology, War, and Fascism,' p. 16 note 22.
- 7 Kellner, 'Technology, War, and Fascism,' pp. 15-38; see also Wiggershaus, *The Frankfurt School*, pp. 292-302.
- 8 Kellner, 'Technology, War, and Fascism,' p. 21; Marcuse, *Reason and Revolution*, p. 433.
- 9 Marcuse, 'Some Social Implications of Modern Technology' (1941), in Marcuse, *Technology, War, Fascism*, p. 41. Cf. Feenberg (p. 4).
- 10 Heidegger, January 20, 1948 letter to Marcuse (in Wolin, ed. and trans., *The Heidegger Controversy*, p. 162); *ibid.*, p. 163. Marcuse indiscriminately associated Heidegger with Schmitt and Bäumler in 1934's 'The Struggle Against Liberalism in the Totalitarian View of the State' (see pp. 31-42).
- 11 Marcuse, May 12, 1948 letter to Heidegger (in Wolin, ed., *The Heidegger Controversy*, p. 164; I am reading Marcuse's self-reference as a displaced warning to his old mentor).
- 12 The irony of their estrangement is compounded by the fact that Heidegger understood his critique of technology as his philosophical repudiation of Nazism; see Hubert L. Dreyfus, 'Heidegger on the Connection Between Nihilism, Art, Technology, and Politics,' in C. Guignon, ed., *The Cambridge Companion to Heidegger* (Cambridge: Cambridge University Press, 1993).
- 13 Augustin Berque, *Être Humains sur la Terre* (Paris: Gallimard, 1996), p. 81; translated and quoted by Feenberg (p. 165).
- 14 Heidegger, *The Question Concerning Technology*, trans. W. Lovitt (New York: Harper and Row, 1977), p. 33; Martin Heidegger, 'Traditional Language and Technological Language,' trans. W. Gregory, *Journal of Philosophical Research* XXIII (1998), p. 136.
- 15 Heidegger, *Discourse on Thinking*, trans. J. Anderson and E. Freund (New York: Harper & Row, 1966), p. 46; Heidegger, 'Traditional Language and Technological Language,' p. 139; Jean Baudrillard, *The Transparency of Evil*, trans. J. Benedict (London: Verso, 1993), p. 4. But cf. Feenberg (p. 204); and Albert Borgmann, *Holding On to Reality* (Chicago: University of Chicago Press, 1999), pp. 218-21.
- 16 Heidegger, *The Question Concerning Technology*, p. 17.
- 17 'Humanity does not have control over unconcealment itself' (Heidegger, *The Question Concerning Technology*, p. 18). Indeed, the very attempt to *control* technology—'the will to mastery which becomes all the more urgent the more technology threatens to slip from human control' (*ibid.*, p. 5)—is for Heidegger part of the problem; willful ontic attempts to control or manage technology risk reinforcing the Nietzschean onto-theology of eternally recurring will-to-power ultimately responsible for our technological epoch of 'the atomic age.'
- 18 Martin Heidegger, *Discourse on Thinking*, p. 52.
- 19 Heidegger, *The Question Concerning Technology*, p. 4; *ibid.*, pp. 30-1; *ibid.*, p. 30.
- 20 Howard Rheingold, 'Look Who's Talking,' *Wired* (Jan. 1999), p. 161; *ibid.*, p. 131; Heidegger, *Discourse on Thinking*, p. 54; *ibid.* (my emphasis). Here we have at least one of the Heideggerian 'criteria' Feenberg seeks: to relate comportmentally to technological things with *Gelassenheit* means, minimally, to be able to *let them go*, to be able to live without the television, cell phone, pager, fax machine, internet hook-up, etc. Of course, counter-examples like the pace-maker and hearing-aid suggest that Heidegger's criterion needs further refinement.
- 21 Donald Kraybill, *The Riddle of Amish Culture* (quoted by Rheingold, 'Look Who's Talking,' p. 161).
- 22 Herbert Marcuse, 'The Struggle Against Liberalism in the Totalitarian View of the State,' p. 39; Karl Marx, *Capital* (Volume One), in *The Marx-Engels Reader*, 2nd, R. Tucker, ed. (New York: Norton, 1978), p. 321.
- 23 Dreyfus, 'Heidegger on Gaining a Free Relation to Technology,' p. 102. For a philosophical defense of Heidegger's hope for a 'new beginning,' see my 'Onto-Theology? Understanding

Heidegger's Deconstruction of Metaphysics,' forthcoming in the *International Journal of Philosophical Studies*.

[24](#)On Heidegger's understanding of this alternative, see *ibid.*, pp. 102-4.

[25](#) Marcuse, 'Some Social Implication of Modern Technology,' pp. 46-8; see Heidegger, *Poetry, Language, Thought*, trans/ A. Hofstadter (New York: Harper & Row, 1971), pp. 152-3.

[26](#)If television has been the best 'opiate of the people' since religion, the internet has the potential to function more like a psychedelic, opening minds and increasing rather than diminishing the interaction between self and world. Feenberg himself steadfastly defends the democratic *potentials* emerging within recent forms of cyber-optimized political networking, paying less attention to the political dangers 'lurking' here as well.

[27](#)Marcuse, 'Some Social Implication of Modern Technology,' p. 46; *ibid.*, p. 55.

[28](#)Thanks for this example go to John Senion.

[29](#)Cf. Charles Spinosa, Fernando Flores, and Hubert Dreyfus, *Disclosing New Worlds: Entrepreneurship, Democratic Action, and the Cultivation of Solidarity* (Cambridge: MIT Press, 1997), pp. 52-4.

[30](#)Feenberg pokes fun at Heidegger's critique of typewriting (see Heidegger, *Parmenides*, trans/ A. Schuwer and R. Rojcewicz (p. Bloomington: Indiana University press, 1992), pp. 80-7). I find it remarkable, however, that in 1942 Heidegger already recognizes (in the replacement of handwriting by typewriting) a symptom of our ontological transformation toward enframing, a transformation which only becomes obvious once typewriting itself is replaced by word-processing. For a convincing argument to this effect, see Hubert Dreyfus and Charles Spinosa, 'Highway Bridges and Feasts: Heidegger and Borgmann on How to Affirm Technology,' *Man and World* 30:2 (1997). When Heidegger looked out at the highway interchange and the powerplant on the Ister and found words which now seem to describe those developments we associate with the internet, genetic research, and cloning, his was not what Auden called "The dazed uncomprehending stare / Of the Danubian despair."

[31](#)Here Feenberg follows the Foucaultian thinker Michel de Certeau rather than 'the final Foucault,' who abandoned his own earlier focus on the power-resistance isomorphism in favor of an 'aesthetics of the self,' after his concrete genealogies taught him that such resistances are too often re-inscribed into the system so as to expand and reinforce its rule. (For a particularly ironic example, we might think of the way in which the New left student movement inadvertently catapulted Reagan to power.)

[32](#)For Heidegger, history does not flow in a smooth, uniform succession; the wheel of history turns in starts and stops, *revolutions* catalyzed by climactic events which set the tone for the epoch which follows; cf. Thomas Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1962). On Heidegger's understanding of a new 'god,' see my 'The Silence of the Limbs: Critiquing Culture from a Heideggerian Understanding of the Work of Art,' *Enculturation* 2:1 (1998).

[33](#)See Ernesto Laclau and Chantal Mouffe, *Hegemony and Socialist Strategy: Toward a Radical Democratic Politics* (London: Verso, 1985).

[34](#)One problem with staking the future of the New Left on the hope that local, situated micro-struggles will *converge* into a democratizing counter-hegemony is the fact that our recent political history seems to demonstrate that egalitarian groups have great difficulty building and maintaining large-scale alliances. Leftist anti-authoritarianism and distaste for coercion often generate an insistence on communal unanimity which (especially when combined with the tendency toward radical self-critique) tends to splinter and divide egalitarian alliances. See Michael Thompson, Richard Ellis, and Aaron Wildavsky, *Cultural Theory* (Boulder: Westview Press, 1990), pp. 86-93.

[35](#)For Heidegger, such democratization for the sake of control would be, at best, an attempt to roll *back* the wheel of history, reconstituting modern *subjects* out of post-modern *resources*.

[36](#) Andrew Feenberg, *Questioning Technology*. London and New York: Routledge, 1999, xvii+243 pp., pb. \$24.95. Unprefixed page references are to this work.

[37](#) For another early example of an attempt to transcend Marcuse's position from within, see Shapiro (1972). [38](#) This may be changing. See Latour's recent (1998) article on ecopolitics, "Ein Ding ist ein Thing - a (Philosophical) Platform for a Left (European) Party," <http://www.ensmp.fr/~latour/popart/p76.html>.