

Book Symposium on Andrew Feenberg's *Between Reason and Experience: Essays in Technology and Modernity*

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Betwixt and Between: Feenberg's Ecumenical Philosophy of Technology

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In this issue, we are pleased to include an exchange between Andrew Feenberg and his commentators David Ingram, Sally Wyatt, and Yoko Arisaka around Feenberg's most recent book, *Between Reason and Experience: Essays in Technology and*

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Modernity (Cambridge, MA: MIT Press, 2010). Andrew Feenberg, a student of Herbert Marcuse, and currently the Canada Research Chair in Philosophy of Technology in the School of Communication, Simon Fraser University, is one of our leading contemporary philosophers of technology. In this book, he brings together a variety of disparate strands of his work: from the influence of Heidegger, Lukács, and Weber, to his interests in information and educational technologies, to concerns about political economy, practical politics, and the relationships between technology and democracy, to Critical Theory, especially the works of Marcuse and Habermas. As such, this book represents a major statement of Feenberg's work and an important contribution to both Critical Theory and Philosophy of Technology.

Although his work draws on many disciplines, including philosophy, media studies, sociology, health communication, science-technology studies, information management, environmental studies, and management, it is most clearly situated within the tradition of Critical Theory. But, unlike many other Critical Theorists, he finds ambiguity and possibilities of freedom and democracy within technological development itself. Because of the centrality of science and technology to our contemporary world, Feenberg's distinct and penetrating analysis makes him one of, if not the, most important members of the current generation of Critical Theorists.

The book is comprised of nine chapters and includes a forward by Brian Wynne and afterward by Michel Callon. Eight of the nine chapters—chapter 2 is a new one—are revisions of previous publications that spread over 16 years and which contain many of Feenberg's major statements of ideas and arguments. Feenberg's interests are broad, and his account of technology arises not only through considerations of other positions in philosophy of technology and STS but also in dialog with the history of philosophy, and around questions such as the nature of causation and essence. Thus, we encounter not only Marcuse and Habermas, Latour and Pinch, Marx and Weber, but also Hegel, Kant, Bacon, Descartes, Aristotle, and Plato. Moreover, because his is a globalized account, Feenberg leads us to consider differing encounters with modern technology in places such as France and Japan.

Feenberg's work is empirically rich and theoretically complex. Throughout, he takes on a series of what he argues are mistakes and wrong directions in philosophy of technology. He addresses problems with technological essentialism, technological determinism, and autonomous technology as well as modernity theory and the social constructionist views of Science and Technology. His take on each of these problems varies. He clearly has more sympathy for social constructivism than he does for technological determinism and certainly finds more of value in modernity theory than he does in the autonomous technology thesis. However, one of the signal characteristics of Feenberg's work is dialectical thinking—a moving between and through differing, perhaps incompatible or even contradictory positions in order to draw out what is right. He thus emphasizes the ambiguities of modern technology and the contemporary world scene and calls particular attention to technological development as ambiguous with respect to the implications it can have for human flourishing and freedom.

One of the mistakes that particularly concerns Feenberg is the dystopian view developed by Adorno and Horkheimer (1972) and prevalent in much twentieth-century Philosophy of Technology. For them, modern technology carries the values of capitalism and of a consumer society. Indeed, they coined the term “culture

industry” to signify the process of the industrialization of mass-produced culture and the commercial imperatives that drive the system. The culture industry, they argued, creates distractions and the semblance of freedom, but it offers no real alternative and only serves to distract people from careful reflection on the conditions of their lives. For Adorno and Horkheimer, contemporary culture includes little critical awareness of technology because what is thinkable is constrained to those options considered rational under a narrow instrumental definition of rationality. Thus, it is difficult for people to think of technology as a bearer of values. The technosciences appear to be value-neutral, and the values of efficiency and instrumentality seem to be the only values that are rational to adopt. Thus, the values of efficiency and instrumentality that characterize the technosciences and industrial production slowly shape the whole of society. Because instrumental rationality characterizes the Enlightenment and subsequent cultures at their very core and is at the essence of technoscience, then technoscience necessarily leads to domination and dehumanization.

In *Between Reason and Experience*, Feenberg disputes the dystopian analysis of Adorno and Horkheimer (1972), and making this case is the thrust of the first third of the book. His account of the development of technical codes demonstrates that social forces have been at work even in what might seem to be the most purely technical realms and one of the most free from any but epistemic values. In many empirically and historically rich examples, he presents the case for a social and a political dimension at the very base of technology. For instance, he traces the history of bursting boilers on nineteenth-century steamships in North America and argues that the eventual settling (after decades and thousands of deaths) on basic standards of safe design—a design code—was the result not of technical knowledge or improvements, but of a coalescence of social and political forces around the necessity of safe boilers. Once this non-technical point was reached, a new technical code, a socially informed set of technical assumptions, became the baseline for boiler design. But, one of the functions of technical codes is to obscure the social, political, and aesthetic dimensions of technical processes. Thus, Feenberg’s analysis reminds us that what might appear as purely technical decisions, as evidence of the determinism of technology, are actually the result of many contingent factors of which technology is but one.

Other themes, woven through the book, deserve mention. In chapter 2, Feenberg focuses his interest on the current environmental crises and, arguing that environmental values can, and if we are to survive of necessity will, become part of the accepted background, rejects an economic trade-off approach to environmentalism. In chapter 6, he turns his attention to Japan, which, he argues, shows that technological rationality is culturally relative in complex ways. Chapter 7 most explicitly addresses the debates and possible convergences between modernity theory and STS about the nature of technology. In chapters 4 and 8, he develops his distinctive version of a Critical Theory of technology. Throughout the book, we find echoes of Hans Jonas’ claim that one of the distinctive and defining characteristics of modern technology, and hence of modern life, is restlessness—an expectation not just of change, but of every increasing pace of change.

Feenberg rejects both essentialism and determinism, and he puts forward a political theory of technology that embraces the social dimensions of technological systems, including their impact on the environment and workers’ skills and their role

on the distribution of power. He constructs a multi-level analysis of the essence of technology in order to do justice to the complex, historic, and indeterminate character of technological design, use, and transformation. Only then, he argues, can we begin to criticize our society's culture of technology and imagine alternatives that would bring out a more democratic, meaningful, and livable environment.

Given Feenberg's engagement with different disciplines and traditions, it seemed fit to include scholars who come from some of those various disciplines and traditions as commentators to his book. Thus, the three pieces included address different aspects of Feenberg's rich and provocative text. David Ingram addresses the theoretical grounding of Feenberg's appraisal of Critical Theory and his account of the possibilities of radical change. For Ingram, there is more of the Marcusean project and Marcuse's notion of the aesthetic present in the work of Habermas than Feenberg acknowledges. Sally Wyatt, an STS scholar, focuses on the relations between Philosophy of Technology and STS, and attempts to determine where Feenberg fits. She suggests that an encounter between Feenberg's work and that of Deleuze and Guattari would be an important contribution to Feenberg's scholarship. Finally, Yoko Arisaka, a specialist in modern Japanese philosophy, Chinese philosophy, and phenomenology, directs her attention primarily on Feenberg's discussion of Japan and Japanese philosophy as evidence of and resources for alternative modernities and culturally differentiated technologies. She notes the importance of and endorses Feenberg's case that technology becomes the site of a creative process between technical rationality and cultures/values. Ultimately, she wonders whether and how resistance and alternative paths, especially those that challenge the dominative patterns, really develop.

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Living Well in the Modern Age: Feenberg on Habermas, Technology and the Dialectic of Reason

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Herbert Marcuse taught his students that they could embrace the liberating potential of technology while rejecting technology in its current, oppressive form. Feenberg and I embraced this thought as welcome relief from the dialectic of enlightenment that had been diagnosed years earlier by Marcuse's former colleagues in the Frankfurt School: a totalitarian "iron cage" (to use Weber's phrase) in which everything of human value—freedom, equality, individuality, and community—is

made to serve the god of Mammon as part of a technical calculus oriented toward ever greater productivity and profit. Marcuse had the good sense to envision a democratic alternative to this top-down dictatorship of technological elites. He proposed abolishing the intense division of labor separating mental management from physical labor demanded by capitalism. But replacing capitalism with socialism would not free us from the iron cage unless we also transformed science and technology—the quintessential heart of modern society. This would require healing the deep wound that modernity itself inflicts on us, a gaping divide in our very being that separates art from technology, lifeworld from system, culture from nature, and—as the subtitle of Feenberg's text underscores—experience from reason.

Marcuse (1968, 1978) sought to suture over the divide by appealing to a conception of aesthetic reason that had more in common with the ancient Greek notion of *technē*, understood as a process of disclosing and realizing natural potentials than with the modern—more subject-centered—notions of aesthetic judgment and experience developed by philosophers in the German Idealist tradition and later appropriated with considerable modification by Adorno and Habermas. Habermas, in particular, is criticized by Feenberg for having mistakenly retained the neo-Kantian oppositions contained in Weber's analysis of modern rationality—embedded in an abstract notion of instrumental action and technology—while advancing a useful, if one-sided, understanding of modernization in terms of uncoupling of lifeworld and system.

While accepting much of Feenberg's criticism, I would like to show how Habermas himself has gestured toward a somewhat different conception of modernization than the one Feenberg attributes to him. This alternative conception appeals to a notion of aesthetic rationality that is surprisingly close to the one that Feenberg appropriates from Marcuse.

Feenberg accepts the basic idea underlying Habermas's Weberian account of modernity (1984b, 1987a, b). Modernization involves the rational disenchantment of nature and society by radically differentiating nature from culture and then subjecting culture itself to further diremption. Rationalization differentiates values of factual truth, normative rightness, and aesthetic pleasure and compels their cultivation in distinct disciplines of science, law, and art, each governed by its own logically distinctive method for progressively solving problems within its proper domain. The knowledge cultivated in these distinctive rationalization complexes propels the three main tracks along which human societies progress: technical–instrumental, moral–practical, and functional. The introduction of functional rationality designates the breaking point along which progressive social problem requires the “uncoupling” of technically organized “systems” from a non-technically, communicatively structured “lifeworld.” The emergence of administrative systems (states) deploying coercive law and self-regulated market economies steered by money—the two historical watersheds mentioned in Habermas's functionalist account of modernization—are both ambivalent, simultaneously liberating us from time-consuming, risky processes of negotiating social interaction discursively while subjecting us to technically automated forms of constraint.

Habermas and Feenberg agree that technically automated systemic constraints can become pathological—alienating us from our modern self-conception as free, rationally self-determining individuals. And they agree that the culprit is not modern

“technicization” as such but the way technicization has been implemented according to the dictates of a capitalist economic system. They diverge, however, on the precise way to describe this intervention. Habermas (1984b, 1987a, b) attributes the pathology to the overextension of technically mediated systems into a communicatively integrated lifeworld that is largely unmediated, except, of course, for the ambivalent effects of the mass media. Feenberg, by contrast, attributes the pathology to the dominance of abstract, value-neutralizing, hierarchy-preserving technical designs in a lifeworld that is less distinguishable from technicized systems than Habermas seems to appreciate. According to Feenberg’s interpretation, the lifeworld—or rather a powerful minority subculture within it that values hierarchy and profit maximization above all else—has colonized the system, leading to undemocratic workplaces and administrations, and unhealthy anesthetic environments.

I believe that Feenberg’s refusal to accept Habermas’s postulation of a strong differentiation of system and lifeworld, with its corresponding postulation of a strong distinction between instrumental and communicative rationality, is supported by two considerations: practically speaking, these distinctions hinder the struggle for workplace democracy, and theoretically speaking, they leave unexplained the aesthetic grounds underlying Habermas’s own critique of a bad technicization (colonization) of the lifeworld.

If Feenberg is right, modern automated technology—no less than money and legal power—functions like a steering medium. Technological systems embody materialized “norms” and “prescriptions” that guide our behavior non-consensually, thereby exhibiting the same ambiguity that characterizes money and power. Technology, too, liberates us from the risks and burdens associated with having to negotiate our shared life discursively but only at the risk of subjecting us to new constraints. Yet, no matter how functionally autonomous technological systems become in relation to the lifeworld—large-scale systems such as electrical grids, for instance, generate a momentum of their own that is hard to resist and control—their concrete design and implementation necessarily reflects the dominant values and interests of society. That is why political struggle over the values and interests that inform technological design must be regarded as designating one important—if indeed limited—possibility for criticizing technological reification. However, to the degree that large-scale technological systems unfold a momentum and logic of their own that resists transformation by a democratic politics of design, a critique of technology must also be pursued along a different track, one that insists on retaining the modern separation—however relative and partial—of dominant lifeworld and a subordinate system. So, although the technicization of the lifeworld is not intrinsically reifying—some automated systems, such as computers, can even enhance communication itself—it can become so. Here, we can retrieve the valid insight contained in Habermas’s colonization thesis: as the case of biotechnology run amok attests, modern automated technologies, no less than money- and power-related exchange relations, *can* produce pathological effects when “over-extended” beyond their proper boundaries into domains of everyday life.

Habermas’ discussion of pathological technicization points to a tension (or even contradiction) between capitalism and democracy. However, it seems that Habermas’ own dualism of system and lifeworld serves to diminish this tension. Although Habermas reminds us that capitalism is only one path that modernization can take,

he never explains what he means by this, other than noting that one alternative—bureaucratic socialism—represents an obviously failed and truncated form of a modern rational society. Indeed, his criticism of Marx for failing to grasp the inherent rationality of a system–lifeworld uncoupling seems to protect market economies and bureaucratic administrations from direct criticism. So long as they are sufficiently “tamed” and do not “colonize” the lifeworld, they seem perfectly rational and unproblematic. The price Habermas pays for this concession to systems theory is steep, however. Much of what first-generation and third-generation critical theorists criticize in alienated labor—the use of technologies that reinforce compartmentalized thought and feeling, the de-skilling of human beings and their reduction to cogs in machines, and the de-sensitization and blunting of consciousness and experience—drops out of his analysis or appears only at the margins of his thinking. If functional efficiency requires this kind of technical organization, Habermas seems to think, then so be it. Only by reformulating the concept of functional efficiency in terms that take into account the meanings and values of the lifeworld (and specifically the values of hierarchy and profitability informing capitalist culture) can we deploy Habermas’s (now softened) distinction between system and lifeworld to criticize alienating media that overstep their bounds (Ingram 2010).

This kind of critique must be guided by aesthetic considerations that take us back to the idea of an integral, healthy life. In his critique of Marcuse’s (1968) defense of a new, non-reifying science and technology, Habermas resisted the metaphysical notion of an intrinsic end to life (the good life) on the grounds that it blurs the boundaries separating nature and culture, instrumental action, and communicative action and fails to respect analytic (logical) distinctions between different cultural value spheres. But, Habermas’ criticism misses its mark. As Feenberg notes, Marcuse’s claim that we can develop a different technological rationality that would enable us to relate to nature “as a subject” is not to be understood as prescribing a return to a premodern notion of natural teleology. Rather, Marcuse’s point (leaving aside his provocative appeal to metaphysics) is that the dominant mode of primary technical instrumentalization under capitalism requires a one-sided quantitative abstraction from qualitative ethical and aesthetic values that belies its concrete realization in value-laden designs. Marcuse’s reference to nature as subject thus refers to nature as repository of value and meaning revealed by technology (in the way, Heidegger (1971: 154) notes, that a bridge defines location and gathers together persons, meanings, materials, and values). As Feenberg remarks, a fully rational primary instrumentalization would permit technical designs that are not exclusively abstract and one-sided in their secondary instrumentalizations; viz. they would permit an enriched concrete realization encompassing multiple functions (including aesthetic, democratizing functions). That is to say, the realization of modernity requires sublating (in the dialectical sense of an Hegelian *Aufhebung*), premodern craft production, with its holistic embeddedness in the lifeworld, by recombining analytically detached elements of nature processed into fully integrated technical systems.

Ironically, Habermas’s earliest contributions as a student journalist (1953, 1954, 1955)—when he was still trying to apply his own synthesis of Heideggerian phenomenology and post-idealistic naturalism à la Schelling, Marx, and Feuerbach to problems of technological alienation in modern systems of production and

consumption—displayed precisely what his later encounter with Marcuse concealed: a sensitivity to the expressive, symbolic nature of instrumental action (work). In so doing, it explicitly highlighted the possibility of implementing liberating technical designs that would integrate art and technology, nature-as-life process, and humanity-as-natural (sensuous) being. Many years after his debate with Marcuse, Habermas would return to some of these youthful ruminations in discussing the “completion of modernity” as a project. In the interim, Habermas had rejected holistic forms of practical reason grounded in teleological conceptions of health (*eudaimonism*) as appropriate bases for grounding critical theory. Now, he reverses himself. If social pathologies reflect a selective (or one-sided) course of rationalization in which abstract processes of learning (rationalization complexes) and split-off technical elites confront each other as alien and opposed, then we must turn to conceptions of aesthetic rationality in order to retrieve the notion of a life lived in integrity. Indeed, it is none other than the experience of art itself that “harbors a utopia that becomes a reality to the degree that the mimetic powers sublimated in the work of art find resonance in the mimetic relations of a balanced and undistorted intersubjectivity of everyday life” (Habermas 1984a: 237). In this respect, art anticipates the fullness of life as it should be lived—a utopia wherein cognition, evaluation, and feeling inform one another in balanced interplay and our relation to nature, self, and society is restored, not only cognitively and abstractly, but corporeally, in the “mimetic” attunement of the individual organism with its environment.

Habermas (1984a: 237) proceeds to link this concept of aesthetic experience to cognitive learning, thereby gesturing toward a distinctly aesthetic (and dialectical) concept of rationality of the sort he had hitherto criticized in the work of his predecessors. He even goes so far as to assert that art raises a claim to truth—different from a cognitive claim to truth—whose justification transcends the rational differentiation and abstraction of formal validity claims.

Here, we are no longer interested in art as an institutionalized rationalization complex opposed to other rationalization complexes; a technically *specialized* domain of learning that furthers the technical means of subjective expression with regard to purely aesthetic standards of taste and validity in exclusion of all else. Rather, we are transported back to Friedrich Schiller’s idea of art as the vehicle for an aesthetic education in which not the specialized experts but lay persons receptively appropriate technology in coming to terms with problems of alienation. This thought is developed at length in a speech Habermas gave in 1980 upon receiving the Adorno Prize from the city of Frankfurt (“Modernity: An Unfinished Project”): “the layperson should educate himself to the level of the [professional art critic] and, on the other hand, the layperson could act as a connoisseur who relates aesthetic experience to his own life-problems” by creatively appropriating artistic techniques (Habermas 1980: 352). Again citing Wellmer, he further adds that “aesthetic experience not only revitalizes the need interpretations in light of which we perceive the world; it also influences cognitive interpretations and normative expectations and alters the way in which these moments refer to one another” (Habermas 1980: 353).

The imaginative appropriation of refined technologies in the reproduction and reception of art for purposes of illuminating life *as it might be lived in its integrity*

recalls the positive side of Walter Benjamin's account of the technological reproducibility of art in the modern age (Benjamin 1969)—the initial shattering of an integral lifeworld experience (*aura*) followed by the subsequent recombination of its abstract elements in a modern, critical form. Art as *technē* “can be perceived as an authentic expression of an exemplary experience. . . and can then in turn take the place of an argument and promote precisely those standards according to which it is an authentic work” (Habermas 1984b: 20). It can disclose the world anew by lending it new significance and value, merging (in Heidegger's sense of the term) the mundane and the sacred, the material and ideal. To paraphrase Schiller: “an aestheticization of the lifeworld is legitimate only in the sense that art operates as a catalyst, as a form of communication, as a medium within which separated moments are rejoined into an uncoerced totality [in such a way] that art ‘leads’ everything which has been dissociated in modernity—the system of unleashed needs, the bureaucratic state, the abstractions of rational morality and science for experts—‘out under the open sky of common sense’.” (Habermas: 1987a, 50).

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Democratizing Technology: Between Philosophy of Technology and STS

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This is an important and oddly timely book. I say ‘oddly’ because (though perhaps this reflects my limitations as a non-philosopher) one does not always expect a collection of philosophical essays to be so pertinent to so many pressing contemporary social, political, and intellectual debates. With his characteristic lucidity and passion, Feenberg addresses the need for a democratic technological politics. Very briefly, his main argument is that modernity is characterized by a hitherto irreconcilable split between (scientific and) technical rationality on the one hand and everyday experience on the other. This split has been described and analyzed by philosophers and others, especially in science and technology studies (STS). Feenberg does not follow the post-human route set out by Latour (1987) and Haraway (1991), for example, nor does he conceptualize technologies in terms of simple tools, as many other philosophers of technology do. But nor does Feenberg accept Latour- or Haraway-inspired analyses of the complexity (or hybridity) of technological systems and their entanglement with the lifeworld. Rather than drawing on examples such as hammers (still common in much philosophy of technology, thus missing the complexity of contemporary technological societies), Feenberg usually deploys much more complex examples. He reiterates points common to STS about the co-construction of society and technology, at all levels, from the individual to the household, to the organization and the nation state.¹ Inspired by Heidegger, Marcuse, and Habermas, he argues for a recombination of reason and experience in order to create a more democratic technological politics.

In order to do this, Feenberg develops the concepts of primary and secondary instrumentalization (and this is where he fundamentally differs from STS scholarship which emphasizes that whether or not a technology is seen to ‘work’ is itself a social process). Primary instrumentalization focuses on the ways in which technologies are functional; they must ‘work’ in order to serve a particular purpose. Objects are de-contextualized in order to make clear what they can and cannot do. But of course, objects do not exist in isolation. They can be combined in various ways in order to achieve a variety of social purposes. This is the secondary level, the integration of simplified objects into a social world. Feenberg also uses the terms ‘de-worlding’ to describe primary instrumentalization, thus drawing attention to its abstract, non-local nature, and ‘disclosure’ or ‘revealing’ (following Heidegger) to describe secondary instrumentalization, highlighting the processes of social determination that are needed to give social meaning to objects.

Feenberg is consistently broad-minded—not only intellectually but also in choosing outlets for his work. The material presented here has been previously

¹ As an aside, Feenberg argues for the value of these more traditional sociological categories.

published in volumes devoted to studies of information and communication technologies and biotechnologies as well as Japanese and Danish philosophy journals. This breadth of publishing outlets is admirable, especially at a time when younger scholars are encouraged to think 'strategically' and publish only in those places conforming to an increasingly narrow notion of quality in order to establish their careers and reputations, often to the detriment of their broader development. It is a collection of previously published material, the first of which appeared in 1992. The chapters have all been revised for this volume. MIT Press and the *Inside Technology* series editors are to be commended for making this material available in a single volume. But, there is something odd about the construction of the book in that it seems to come with an 'STS health warning' in the form of a foreword by Brian Wynne and an afterword by Michel Callon, two eminent STS scholars. Of the now 50 volumes in the *Inside Technology* series, only one² (as far as I can tell from the MIT Press Website) has a foreword, again by Michel Callon. One could be cynical and conclude that Callon's name on the cover helps to sell books, but that still leaves the question of why only Feenberg's book merits both a foreword and an afterword. Sometimes, forewords are written by well-known scholars in order to draw attention to the work of promising, younger scholars. That can hardly be the case here as Feenberg is quite probably the most distinguished philosopher of technology writing in the early twenty-first century. My speculation is that, given the long and sometimes difficult relationship between STS and mainstream philosophy of science and technology, it was felt necessary to reassure the predominantly STS audience of this series that it was safe and worthwhile to read this book. If I am correct, it is rather sad for STS and rather insulting towards Feenberg and philosophy of technology more broadly. I consider STS to be my primary academic identity, so I am writing this as an insider. The inclusion of both a foreword and afterword seems to demonstrate a defensiveness on the part of STS that is not warranted after 40 years of path-breaking work, first in the sociology of scientific knowledge, and in what is now more usually referred to as science and technology studies, or science, technology, and society studies. The success of the field is at least partly due to the breadth and depth of the MIT *Inside Technology* series itself.

Both Wynne and Callon are keen to emphasize the points of agreement between STS and Feenberg's philosophy of technology, though they remain critical of philosophy of science and technology more generally. But, they both overlook or try to smooth over some crucial differences. Wynne raises a series of questions about whether science could or should also be open to more democratic intervention along the lines that Feenberg argues are necessary for a democratic technological politics. Or, asks Wynne, will a democratic technology automatically lead to more democracy in science, which presupposes a linear view of the relationship between technology and science that neither STS nor much philosophy of science and technology would

² Gabrielle Hecht's second edition (2009) of *Radiating France: Nuclear power and national identity after World War II* includes a foreword by Callon and an afterword by Hecht in which she updates the material since its first publication in 1998. One could speculate that, in this case, Callon's role is to provide legitimacy to a book about France written by a non-French author. However, if that is the case, then it might have been more valuable for the first edition, when Hecht was still relatively unknown. Given that the first edition won two major book awards, it hardly needs further endorsement (not that it is not nice to have, of course).

endorse. While these are very good questions that Wynne, among others, has gone a long way to address, they are beyond the scope of Feenberg's work, and nor does 'science' fit easily into his primary–secondary instrumentalization frame. Wynne goes too far in his search for commonality when, in his first paragraph (p. ix), he suggests that where Feenberg prefers 'technology', STS prefers the term 'technoscience'. While Feenberg does occasionally talk about 'technology-science', he very rarely uses the term technoscience and nor is it in the index. Technoscience is a much more slippery concept that it may be wise to avoid, given that it covers the spectrum from the trivial such as a hybrid of technology and science to the rather more profound such as an engineering way of doing or being in science. My reading is that, when Feenberg says technology, he means technology in a common-sense way, as experienced by him and millions of others. His contribution is to draw attention to primary and secondary instrumentalization as mentioned above.

Callon's enthusiasm for finding agreement between STS and Feenberg leads him to the startling observation that Feenberg has put 'philosophy of technology back on the right track' by ridding it of 'its false humanist accents' (p.219). I could not possibly comment on the first part of this observation, but Feenberg is a humanist, and unapologetically so. His democratic technological politics does not extend to establishing a 'parliament of things', though he may accept the force of Haraway's (1985) original plea that people should recognize their cyborg selves and that, in a highly technical world, an idealized notion of an essential human self does not make much analytical or political sense.

Wynne and Callon are right to suggest that Feenberg and STS share a concern with developing a more democratic technological politics (which means that STS scholars may have to re-engage with normative questions). A question for them all, however, is what actually such a democratic technological politics might look like. The only practical example of technoscientific politics voiced by Haraway is the consensus conference where 'ordinary' citizens discuss technological choices with a range of experts and politicians. Wajcman (2004) suggests this is a rather mundane practice for someone committed to cyborg radicalism. Wajcman may be being too harsh here—involving citizens in technological decision making in a meaningful way is both a radical and a difficult task. But, her general critique is well taken: can theoretical insights inspired either by feminism (in Haraway's case) or critical theory (in Feenberg's case) be useful for empirical research as well as for political change and action? Feenberg's answer is more varied than that of Haraway, and he sees many possibilities for political action, including via individual and collective acts of resistance, as well as via both representative and participative forms of democratic engagement. Others in STS, not only Wynne and Callon but also Sheila Jasanoff (2005) and Wiebe Bijker (2007), are also currently engaged in experimenting with and theorizing new forms of democratic technological politics. But, there is much work to be done, as in all cases, the notion of democracy receives much less critical attention than the notion of technology. The ways in which democracy varies over time, locale, and issue needs more attention.

The final point I would like to raise is about Feenberg's choice of philosophical inspiration. He has published extensively on Heidegger, Marcuse, Habermas, and Lukács, suggesting a primary engagement with the Germanic tradition. But, he has also published about the Paris May 1968 events and includes an extensive reflection

of the French Minitel experiment in this book. He knows France well. Yet, with the notable exception of Latour, he rarely mentions other French philosophers, of whom there are many. In particular, I am curious about the relationship between Feenberg's reflections on reason and experience with Deleuze and Guattari's (1988) use of insights from vitalist philosophy. Deleuze and Guattari's focus on 'desire' (and its clear link to Freud) is not the same as Feenberg's notion of 'experience'. Yet, there are potentially interesting points of connection between primary and secondary instrumentalization as instances of de- and re-territorialization, central to Deleuze and Guattari's analysis of how capitalism always threatens its own reproduction. It may be worthwhile to consider together Feenberg's 'revealing' and 'disclosure' with Deleuze and Guattari's ideas about 'immanence' and 'potentiality'. Even though the language of desire, rhizomes, and multiplicity is increasingly used by neoliberal capital, the original radical political impulse in the work of Deleuze and Guattari may also have something to contribute to the development of democratic technological politics as promoted by Feenberg.

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Toward a Global Critical Theory of Technology: On Andrew Feenberg's *Between Reason and Experience*

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Andrew Feenberg's *Between Reason and Philosophy: Essays in Technology and Modernity* is truly an inspiring book. In today's over-specialized environment of academic philosophy (which rendered the field more or less socially and politically irrelevant), the book brings us back to reality, to what matters politically, to what is

relevant, and to what inspired us to pursue philosophy in the first place. As the tradition of Critical Theory in Germany today is losing its critical edge as it concentrates more on the “analyses of society” (*Gesellschaftsanalyse*), Feenberg’s work continues the transformative legacy of the Critical Theory at its best. The importance and significance of the book are far-reaching, extending well beyond philosophy and academia. It is about responsibly conceptualizing the directions of our future.

Let me focus my discussion on chapter 6, “Technology in a Global World.” One need not specifically point out today that technology is indeed *the* most significant vehicle of the process of global modernization. Technological transformations are literally changing the face of the earth (and beyond) as we speak today. And we have only seen the beginning, as China and India (comprising a third of world population with enormous potential for development and consumption) enter the global techno-economic scene.

In this context, Feenberg’s analyses of the nature of technological transformation in a globalized world (through the example of Japan and Japanese philosophy) are not only highly interesting and insightful in their own right, but their implications are acutely relevant. Let me elaborate on the following idea: reflecting the overall argument of the book, Feenberg makes it clear that technology, as the site of a creative process between technical rationality and cultures/values, “is not merely a means to an end, a neutral tool, but reflects culture, ideology, politics” (p. 108). The example of Japan’s rather sudden modernization process since the mid-1800s makes it quite obvious that technologies developed in the West reflected values and “ways of life” from the originating countries (Western-style floors needed for the Western-style department stores, p. 108), defying our usual assumption that technology is culture-neutral. In a cross-cultural examination and confrontation, what seemed to be “neutral” or technically driven turns out to be culturally specific; the use of computer keyboards (for the Westerners), for instance, appears technically neutral and unproblematic for those in the West, but it presented “an alienating encounter, a challenge to the national language” (p. 113). At the same time, however, due to the sharable/universal character of technical rationality, the Japanese were also able to develop technologically—the first non-Western nation to do so, but as we know today, it is not special to Japan. But, Japan nevertheless presents a test case for what might be called an “alternative” modernity to the usual Western one, if cultures and values are indeed reflected in the creation of particular technologies.

Globalization processes involve what Feenberg calls “system-centered design” (p. 111). Unlike the earlier “branching” patterns in which different technologies in different cultural contexts developed relatively independent of each other, or the “layering” patterns in which different culturally specific technologies are combined to produce a hybrid, the process of “system-centered design” is much more tightly restrained by a globally ubiquitous capital goods market. The globalizing and transnational economy develops component parts such as “gears, axles, electric wires, computer chips,” and these can then be assembled by different countries (in different cultural contexts), but since the prefabricated parts as well as the global market already largely determine the particular designs and end-products, national or cultural characteristics are hardly to be seen. There are minor differences (in design and application, etc.) that still fit the national needs and value patterns, but they are

made to fit within the existing system that is already functioning within this global market economy. The process of system-centered design thus “imposes many constraints at an early stage in the design process, constraints that originate in the core countries of the world system” (p. 112). National or cultural specificities become increasingly overshadowed, made irrelevant, or even eliminated, and the global market economy makes technologies homogeneous across the globe, further enforcing our perception that technology is indeed culturally neutral.

However, Feenberg is optimistic. Although it is true that the global market economy largely controls and predetermines technical design everywhere, there are indeed sites of difference and unique contributions from the periphery. (Feenberg cites an example from Japan's cultural obsession with “miniaturization,” which influenced technical design and marketing on a global scale, p. 113.) Since the process of technical design production is not simply a “core/periphery” relation but indeed a dynamic, hermeneutic one (albeit weakly), there is at least a possibility that new, culturally informed innovations and developments could come into the system and further influence it.

This is an enormously interesting idea, especially since the globalization process today involves predominantly non-Western giants (particularly from Asia) possibly entering into the core of the system, presumably with different cultural backgrounds. So far, the influences are hardly to be seen, for instance from China, Korea, or India, as their impetus is to imitate and “try to catch up” with the West, not only in technology but also in values (which they might believe necessary to become modernized in the Western sense). So, what we see today is simply a massive and rapid development of “new capitalism” in China or India, but could there be a form of “neo-Confucian-influenced” technical designs, for example, to come out of China as it becomes increasingly more confident of its own national heritage? (And what might that look like? Some technical design which intervenes on the “too-democratic” nature of online communication? Educational software that trains children in Confucian values? Already existing are medical technologies designed to fit Traditional Chinese Medicine, such as electronic devices one wears that increase immune-system boosting *chi*. Would such technologies be able to enter the global system or simply remain in Asia?)

Apart from miniaturization, one might be able to give the example of “cuteness and cool” (“*kawaii, sugoi*”) as the primary value of youth culture in Asia which has become globalized, especially in consumer design.³ Coming out of Japan in the 1970s and 1980s and continuing today, not only should technical gadgets be small, but they should also be “cute/cool” (mobile phones, computers, MP3 players, vacuum cleaners, microwaves, TVs, not to mention various software developments and technically sophisticated toys and accessories such as “Tamagotchi”); they must have cute forms, cute designs, an overall effect which makes the owner the ultimate subject of cuteness and cool. Granted, it is nearly exclusively a question of form and not core components, nevertheless it had an enormous impact on the market and

³ An interesting comparative discussion is found in Thorsten Botz-Bornstein (2011). Botz-Bornstein presents the aesthetic values of “cool-kawaii” as resistance to the oppressive, homogenizing effects of technocratic culture, forming a kind of “new modernism” that transcends both traditionalism and anti-traditional modernity.

product development aimed at youth, and today it has become globalized—it is no longer a specialty of Japan. There are numerous cuteness-enhancing products that are originally Korean, Chinese, Taiwanese, Indian, and importantly, American or even European, all flooding the market aiming at young people of any country across the globe, and one can hardly point out the origin (although culturally keen youth all know that it is “cool-Asian” in some vague sense).

On the other hand, one could also cite examples which show the cultural specificity of technology through its *resistance* to becoming global. Two examples I can think of are the “Washlet” technology and humanoid robotics development in Japan. More than 30 years in use in households, “Washlets” (a trademark of the largest toilet-maker TOTO, but there are numerous other brands) are devices one attaches to toilet seats (or nowadays, it is the integrated toilet seats themselves), which spews warm water in exactly the right temperature and angle, so that one can “wash the parts,” followed by the warm-air “drying”, leaving everything fresh after each use. One can control the water-pressure, temperature, angle, as well as the duration of the wash. Today, just about every household has it, as well as in the toilets of department stores, restaurants, public buildings, and even in some train station toilets. It certainly reflects the cultural obsession with cleanliness (which borders on the idea of medically required hygiene) that became technologized and commercialized with amazing success in Japan, but the flourishing market has not entered the global scene. For those in America and Europe, a bottom-washing toilet seat remains an alien and not-necessarily-desirable piece of technology.

Humanoid robotics technology is another example that shows cultural specificity. Robots in the West are largely seen as technical devices that aid production, or are used as military or aerospace technology aids, and they don’t look much like humans since such a feature is not needed and not desired. However, in Japan, a flourishing branch of robotics technology focuses its development on “CareBots” (a federally funded research project at the University of Miyagi), humanoid robots that communicate and assist people, especially the elderly.⁴ Such humanoid robots usually have “cute” female voices, with big round “eyes” that make them appear child-like. Some are even designed to have “Japanese manners” with polite languages and censors that make them maintain a respectable distance to people. Apart from CareBots, there are “Keepons” (a “cute stuffed toy robot” for keeping company and comfort, “*iyashi*”, a Japanese concept for “psychological healing through comfort”, already in use in hospitals and elderly care-homes), “Infanoids” (baby robots designed to increase psychological stability and the ability to care for others in adults), PetBots (e.g., Aibo from Sony, which failed to sell in the West). The large-scale success of such a technological development is still to be seen, both technologically as well as in terms of acceptance into the wider culture. However, it is still interesting to note that, unlike that in the Western imagination in which the robots are cold and machine-like, the mostly menacing Other of humanity, in Japan, they are seen as the continuation of humanity, capable of care, keeping company, and even “imitating feelings” in the future. As the population ages (and the succeeding generation shrinks, and so is less and less able to provide adequate care),

⁴ See, for example: <http://www.myu.ac.jp/~xkozima/carebots/index-eng.html>.

the perceived need for an alternative form of care pushes the development of such technologies. The cultural values reflected here are not only that the nature/culture distinction is blurred but also the idea that the care of the elderly is seen as centrally important and that this care must be provided with a “personal touch” (and *therefore* the need for a humanoid, paradoxically), rather than through institutional settings, such as investing in large-scale elderly facilities, although this too is done, with numerous “personalized technologies” such as robotics and communication technologies. I find it simply hard to imagine that such robots would be welcomed in the West, except among the exclusive communities of techno-freaks.

These examples might show that there are indeed cultural fissures in the development of technology and that different trajectories which resist the subsumption into the system might indeed be possible, and if the market-share is large enough (for instance in Asia), even though it may not become globalized, a “parallel development” and recognition of an “alternative modernity” might at least be achieved. The examples also show that, in order for a piece of technology to become integrated in a global system, a relatively common shared value must already be in place. Appreciation of compactness and even the aesthetic value of cuteness are more universal than values attached to cleanliness or the ontological understanding of “what is human” and the protection of the meaning of “humanity.”

In closing, let me mention a worry that I have. Granted that cultural interventions in technical designs can occur at the peripheries and at times even become integrated in the global system, in the global economy dominated by transnational corporations (which not only control system-centered designs but define technical and other cultural values), how can resistance and alternative paths, especially those that challenge the dominative patterns, really develop? The gap in power, accessibility, technical knowledge, resources, infrastructure, etc. are all known obstacles for those who are powerless (and therefore the objects rather than the subjects in the system) to be able to develop a voice of their own. The overdetermination of global technical culture through the global power structure practically eliminates the possibility of dissent and democratic transformation, even though, theoretically, such alternatives could be conceived. Would the engineers and those in technical development themselves become more politically aware and progressive? (I have tried to show an example of this elsewhere (Arisaka 2001) through the “Women and Water” project in which feminist water engineers incorporated local women in the developing countries in creating water purifying technologies.) Or should it be through international organizations or a coalition of national governments that oversee and regulate technological developments which are more globally democratic? Or progressive industries building financial incentives for globally equitable and/or future-sustaining forms of technology? In other words, would a technologically and financially capable “spokesman” from the dominant group be needed, in order to foster, develop, and represent the ideas of those without power? I would love to see a truly postcolonial technological development (that would indeed be an example of an alternative modernity), for example, out of Africa, and although the possibilities are not written out in Feenberg’s model, the real possibility for such a development seems quite remote, due not to technical constraints but to the structures of the global economy and politics that determine the patterns of global supremacy. But, to

the extent technology is indeed between reason and experience, we may perhaps continue to look for hopeful developments and possibilities.

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The View from Three Fields: The Frankfurt School, Science and Technology Studies, and the Theory of Globalization

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1

David Ingram argues that Habermas came far closer to my position and that of Marcuse than I give him credit for. Marcuse saw art and the aesthetic imagination as sources of radical social change. I have followed Marcuse in regarding the imaginative grasp of historical possibilities as the foundation of radical critique. In this, our view contrasts with Habermas' reliance on discourse and a rather formalistic conception of rights.

Ingram shows that Habermas came to appreciate the contribution of aesthetics in the 1980s, long after his early critique of Marcuse seemed to dismiss its political significance. Habermas' positive comments on the aesthetic recognize that it has the power to de-familiarize and renew perception, to challenge cognitive routines and norms, and to link together artificially separated moments of experience. He invokes the appeal of aesthetic judgment to "common sense," presumably in something like Kant's understanding of the term in *The Critique of Judgment*, to refer to the unifying power of art. Art would give insight not into the world but into our own nature and its requirements, something we of course share with others and which is the basis of the possibility of mutual understanding through communicative action. Habermas extends this argument to philosophy which has a similar unifying function.

However, despite this interesting and suggestive reevaluation of the aesthetic, Habermas's ambivalence is never fully overcome. For example, *The Theory of*

Communicative Action (1984) treats the aesthetic relation to the social world as a non-rationalizable complex characteristic of the Bohemian lifestyle. Translated into contemporary terms, this amounts to a dismissal of the attempt in the counter-culture of the 1960s and 1970s to realize aesthetic criteria of the good in everyday life, precisely what Marcuse valued in the social movements of this period. For Habermas, the wisdom of the aesthetic remains confined to discourse. Thus, in one of the passages, Ingram cites, he writes that “an aestheticization of the lifeworld is legitimate *only* in the sense that art operates as a catalyst, as a form of communication...” (my italics) This contrasts with Marcuse’s reference to the early twentieth-century avant garde’s demand for the realization of art in life.

Habermas’s ambivalence is related to his interpretation of the Weberian notion of differentiation of cultural spheres. Habermas understands differentiation as a fully realized tendency of modernity. Clearly, he is right to argue that differentiation has occurred in modern times. The obvious examples are the separation of offices and persons, politics and religion, art and science, and so on.

But, just how complete is the differentiation in reality and what continuing links between spheres continue to exist, not as regressive remnants but as properly modern features? I do not find any attempt to address such questions in Habermas, but they are central to my own argument and to a political theory of the aesthetic. Habermas misses the continuing subtle interaction between the lifeworld and systemic cultural spheres. Values circulating in the lifeworld give rise to a variety of forms of modernity and even open the possibility of a radical alternative.

Reifying differentiation as Habermas does makes it difficult to appreciate the unifying power of aesthetics and impossible to argue for the realization of aesthetics in the concrete life process of modern societies. Indeed, on Habermas’s terms, beyond the salutary effects of aesthetic reflection on the unity of life lies only dedifferentiation and regression. The problem as I see it is to reconstruct differentiation theory more realistically than the idealized notion of fully realized separation allows. This will open up reflection on the value of the aesthetic in the reform and transformation of modern societies.

How to proceed? I have introduced the theories of social rationality and formal bias to explain the limits of differentiation without denying its central role in modern social life. I argue that differentiation is effective to the extent that it realizes a rational principle in social structure. For example, the market economy realizes the principle of equal exchange of money for goods, and the bureaucracies and administrations realize the principle of classification and uniform application of rules. The case of technology is similar: it realizes causal principles in artifacts. In all these cases, differentiated spheres are coherent to the extent that rational principles are at work in them. In this, they differ from premodern undifferentiated institutions that have an unsatisfactory ad hoc form from the standpoint of modern rationality.

The Enlightenment aimed its critique at such arbitrary deviations from an idealized rational organization of social life. The “privileges” of the nobility and clergy were condemned in the name of equality before the law, inherited offices rejected for selection of officers by merit, the will of the king, dependent on his good pleasure, condemned in the name of the general will of the people arrived at through rational discussion and voting, and so on. This is the origin of our differentiated modernity which was established in one or another way in every modern society.

Rationality is understood in Western culture as context-free, universal, and normatively neutral. It is supposed to be valid everywhere and at all times. It is, no doubt, true that mathematics and natural science at least try to conform to this ideal. Because we associate the rationality characterizing modern social institutions with the idealized notion of rationality relevant to these disciplines, it appears to be beyond criticism. But, this is an illusion. It is the illusion shaping the extreme version of differentiation theory Habermas endorses. Social rationality is not context-free; it is neither universal nor neutral. Yet, it is surely distinct from the privileges, inheritances, and arbitrary will it has replaced. We must define an intermediate position between premodern social forms and an idealized notion of rationality that does not describe actual modern institutions.

Technology is a good place to work out this intermediate position because it is so clear that the design of artifacts is contingent on the social forces that have the power to shape it. Where many alternatives are available, as is usually the case with technology, the choice between them will often be politically fraught. This “underdetermination” of technological design leaves room for social influences to play a role. But, the bias established through these social choices is quite different from the premodern bias imposed by fiat or tradition. It does not appear as the arbitrary prerogative of legitimately privileged persons or as a customary usage but rather hides in obscure technical specifications. Critique is thus more difficult and indeed may be overlooked entirely due to positivistic and deterministic prejudices.

I have introduced the concept of “formal bias” to designate this modern form of context dependence of social rationality. Formal bias is at work in all modern social institutions. Markets and administrations, like technical artifacts, are shaped by the social forces with the power to configure them. Under their design horizon, the institutions function according to their appropriate social rationality while nevertheless discriminating. Thus, one can tell the difference between a market configured in such a way as to favor a particular social group and outright bribery or theft. The system has coherence and is not purely arbitrary. But, it is not necessarily fair for that matter.

This implies that system and lifeworld interpenetrate essentially and cannot be defined independently of each other as Habermas appears to believe. But then, the question is raised of how to democratize the system, to make it responsive to a wider range of social forces than generally prevails under current conditions. For this to happen, the underlying population must have a conception of the good relevant to the problems it confronts that drives its efforts to control and channel progressive development. But that in turn presupposes precisely the sort of reflection on the unity of the dispersed moments of social life Habermas identifies with the aesthetic.

But what is the population expected to do with the insights it gains through aesthetically charged perception and reflection? The passages cited by Ingram indicate clearly that the contribution of aesthetics must be confined to discourse where it can be related to “common sense.” But what then? Is no action to follow? What consequence does Habermas expect? I do not know of a text in which Habermas answers such questions, but I would guess that he imagines reform of the lifeworld and restoration of its claims within its own sphere, but no transformation of the systems that actually organize most of modern social life. He does not define program in terms of decommodification and participation.

Marcuse went beyond this rather limited conception of the role of the aesthetic to imagine the reform of technological rationality under the aegis of the imagination. We can reframe his intuition in terms of the concept of formal bias: the task of the aesthetically informed perceptions and reflections of the underlying population is to motivate and orient the redesign of systems to represent a peaceful way of life responsive to a wider range of interests and needs. This has implications for the intensity of competition, the role of democratic participation in administration and technological decision making, and the character of work and leisure. The essential difference with Habermas lies in the explicit reference to *system design* which is absent from his formulations.

2

Sally Wyatt's discussion proceeds from a very different perspective. Wyatt is an active participant in the world of science and technology studies. She is interested in my relationship to that world and the implications of my approach for research. I will pass on her comments on the "oddity" of STS scholars writing a preface and postface to the book. There is an element of contingency on which I will not comment. Of more significance is the challenge of bringing philosophical reflection on technology to the attention of the STS community. Given the negative expectations shaped by the heavy dose of Heideggerian technophobia prevalent in much humanistic discussion of technology, I do not think it inappropriate or insulting to attempt to reassure the STS community that this book may be of interest to researchers in the field.

Wyatt reviews in some detail the arguments of the preface and postface, seeking signs of unacknowledged friction between my views and the STS mainstream. It is true that there are differences especially around the relation of science to technology. I hope I am not exaggerating in noting that it is commonplace in STS to soften the distinction between them, hence the usage of the term technoscience which erases the distinction altogether.

I agree with Wyatt that this is problematic. The worlds of research and production differ in terms of the range of interests that are legitimately involved. The point is obvious: paying the editor of a scientific journal to publish an article despite negative reviews is bribery, but no one finds it odd that companies pay to advertise their wares despite negative reviews in *Consumer Reports*. When the distinction blurs in medical research, this is a scandal rather than a new norm.

What makes for difficulties and justifies the use of the concept of technoscience are those cases in which the same procedures and apparatus serve both in an experiment and as a production prototype. This is commonplace in the biological sciences and leads to situations where scientific work must satisfy two masters: a scientific community demanding proof of scientific hypotheses and a business community seeking opportunities for profit through the production of useful technological artifacts such as medicines. There is much interesting research on such cases, but it does not prove the irrelevance of the distinction between science and technology. Rather, it sharpens our understanding of the complexity of the relations between them today.

If I choose to focus on technology in the common acceptance of the term, this is because we live with it in our everyday lives. Technology appears in the lifeworld and indeed constitutes the framework and background of much of our experience. This is why our response to it is relevant for the question of democracy. Experience influences the opinions and ideas of ordinary people (and even philosophers, STS researchers, and scientists are “ordinary” when they step outside their specialization.) It provides a unique cognitive basis for intervening in technological decision making despite the lack of professional qualifications.

We know, for example, that the authorities cannot always be trusted and that many chemicals are dangerous. These elementary experiential heuristics may make us reluctant to accept a toxic waste incinerator in our vicinity. Protests may greet plans for citing such a device near residences or schools. I call such protests “democratic interventions.” As these examples shows, no formal procedure such as a consensus conference or election is necessary for the democratic expression of opinion in the technical sphere. In fact, formal procedures are often invoked to close down debate. This is why I am interested in the widest variety of interventions as Wyatt acknowledges.

I can agree with her that far more needs to be done to incorporate a democratic perspective into STS research. It is a reflex to focus on the activities of officially empowered actors and difficult to bring in the contribution of “irrelevant” actors or unauthorized publics. Yet, these latter may be enormously important. Consider the case of human communication on computer networks, introduced and developed from stage to stage by isolated individuals or minor companies. Looking back from the standpoint of the later success of a Facebook or a Twitter, it is easy to forget these inauspicious origins. It is not so much the genius of the initiators that intrigues me, as the process in which their ideas were taken up spontaneously by millions of users. That process effectively transformed the computer as a professional tool into a widely used medium of communication in response to what Walter Benjamin called modern man’s legitimate right to be reproduced.

The title of my book highlights the relations between “reason” and “experience.” By this choice of key words, I intend to signal the specificity of modern societies, organized around rational systems, while also acknowledging that these systems are contingent on social forces and receive ample feedback from the experience of those whose lives they shape. The largely hidden reciprocity between reason and experience is becoming increasingly visible as technology intrudes more and more on everyday life. Democratization is one possible outcome of this situation, an outcome we should certainly encourage.

3

Yoko Arisaka addresses the question of the universality of modern technological civilization. The notion that Western technological achievements have the kind of general validity we ascribe to science and mathematics is tested as Asian nations modernize. This process began with Japan in the mid-nineteenth century. Seemingly, no culture could be more different from that of the West than the one evolved during 250 years of fairly strict isolation in Japan. Yet, the country was able to modernize

rapidly through the importation and imitation of Western technology. The fact that this technology was, to some degree, culturally specific created deep tensions in Japanese culture that are still working themselves out. Meanwhile, other Asian nations have engaged the same path Japan followed with equally portentous consequences.

Arisaka does not question the cultural relativity of technology, but she wonders how significant it will prove to be in the long run. Technology is now global. Differences are quickly ironed out as each nation draws on the available resources circulating in global markets dominated by the West. The one important instance of reciprocity is miniaturization, a specific contribution of Japanese culture to the fund of world technology. Arisaka questions whether neo-Confucianism in China could contribute something of equal significance.

I would have to agree that technologies reinforcing premodern Confucian ideas of hierarchy are not likely to have widespread success. But is this actually the level at which cultures can be expected to influence technology? There is no easy answer to this question. Who would have suspected the significance of miniaturization in Japanese cultural artifacts such as bonsai before its effective application to modern technological artifacts? The cultural resources that may influence technological development are likely to be obscure until they find expression. They are unlikely to be found at the superficial level of opinion and ideology.

Arisaka confirms this judgment with her own example of the influence of the Japanese notion of cuteness. Cuteness as a cultural value would seem quite remote from the Samurai ethic viewers of Japanese movies identify with Japan. Yet, it too, no doubt, has roots in the past and in aspects of gender relations even today. Indeed, Japan is rather unusual in marking, indeed exaggerating, gender difference through highly formalized gendered modes of linguistic expression as well as differences in gesture, dress, and hair style. Cuteness appears to be a projection of female gender attributes onto artifacts. It is curious that this is happening at a time when Japanese women are increasingly assertive. Could it be a peculiar expression of the growing distance from the naïve acceptance of gender differences?

The production of cute “female” robots seems to confirm the gender connection, but Arisaka has doubts about the generalizability of this particular innovation. She may well be right. Western culture may never be hospitable to personal robotics. Yet, this example suggests the possibility of nationally or regionally specific patterns of innovation despite the pressures of the world market.

At the end of her comment, Arisaka wonders whether alternative technology can be developed in a world so thoroughly dominated by global capitalism. If not, my demonstration of the possibility in principle of alternatives would be without application. My answer is tentative for the good reason that we cannot know what the future holds, particularly at this time. Global capitalism is proving to be remarkably fragile, far more dependent on state power than seemed possible only a few years ago. Could it be that this dependence prepares the emergence of nationally specific alternative modernities?

There is also reason to doubt that the development path first explored by the West and later followed by Japan can be generalized to the entire globe. The exclusion of billions of poor people from the partial modernization that has taken place in developing societies destabilizes them and calls forth ideas for alternative

developmental paths. For example, movements for “social technology” in Latin America bring together alliances of technical professionals and poor people similar to the case Arisaka described in her study of “Women and Water.” Such movements are no longer marginal but begin to draw support from governments and major economic institutions.

I am often accused of optimism, and I suppose these remarks justify the accusation. But, I do not make predictions; I merely want to hold open possibilities where they appear to exist rather than conceding defeat in a fluid and confusing situation. The dialectic of reason and experience continues still. It has not yet been arrested in a Brave New World.

References

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