DANISH YEARBOOK OF PHILOSOPHY

MUSEUM TUSCULANUM PRESS

VOLUME 42
2007

Published for
Dansk Filosofisk Selskab
in cooperation with
the Philosophical Societies of Aarhus and Odense
and with financial support from
the Danish Research Council for the Humanities

*

*

Articles for consideration and all editorial communications should be sent in three copies to:
Danish Yearbook of Philosophy
University of Copenhagen, Department of Philosophy
Njalsgade 80, DK 2300 Copenhagen S, Denmark

Business communications, including subscriptions and orders for reprints, should
be addressed to the publishers:
MUSEUM TUSCULANUM PRESS
Njalsgade 126
DK 2300 Copenhagen S
Denmark

*

COPENHAGEN, DENMARK
PRINTED IN DENMARK
BY SPECIAL-TRYKKERIET VIBORG A-S

ISBN 978 87 635 0980 0
ISSN 0070-2749

CONTENTS

Andrew Feenberg: *Between Reason and Experience* 7-32

Kaj Børge Hansen: *Remarks on Wittgenstein's Philosophy: Private Language and Meaning* 33-73

Christian Beenfeldt: *Ungrounded Semantics: Searle's Chinese Room Thought Experiment, the Failure of Meta- and Subsystemic Understanding, and Some Thoughts about Thought-Experiments* 75-96

Søren Riis: *Genealogies of Modern Technology* 97-109

Esben Nedenskov Petersen: *Skepticism and Transcendental Arguments from Semantic Externalism*..... 111-122

Danish Yearbook of Philosophy, Vol. ***42*** (2007), 7-32

BETWEEN REASON AND EXPERIENCE

Andrew Feenberg

Simon Fraser University

Introduction

Everyday experience has a teleological character that ancient science raised to the level of an ontological principle. In modern times the new mechanistic concept of nature shattered the harmony between experience and scientific rationality (Whitehead, 2004: 30-31). The world split into two incommensurable spheres, a rational but meaningless nature and a human environment still rich in meaning but without rational foundation. In the centuries since the scientific revolution no persuasive way has been found to validate experience or to reunite the worlds despite the repeated attempts of philosophers from Hegel to Heidegger. This is not just a theoretical problem. Experience teaches caution and respect for people and things. Experience brings recognition that the Other has its own powers, limits and goals. Once the lessons of experience no longer shape technical advance it is guided exclusively by the pursuit of wealth and power. The outcome calls into question the viability of modernity. The genocidal 20th century is now followed by a new century of environmental crisis.

Technology stands at the crossroads of all these developments. It is both an application of scientific-technical rationality and the background of the world of experience. Communication between the two realms ought to be possible around technical problems if nowhere else. Philosophy of technology thus has a unique vantage point from which to consider the modern dilemma. This vantage point has been occupied fruitfully by Heidegger, whose concept of world is deeply implicated in his notion of technical practice. Yet Heidegger himself failed to draw out the most important implications of this coincidence. In Marcuse a more socially concrete formulation of a similar approach opens the way to a solution which I will sketch in the conclusion of this paper.[1] Accordingly the paper is divided into three main parts, a first part on the relation of technique and world in Heidegger, a second part carrying the story further in Marcuse's Marxist reformulation of the Heideggerian approach, and a third part in which the concepts of technique and world are reconsidered in relation to environmental crisis.

The philosophical issue concerns the relation of norms derived from concrete experience to rationalized technical practice. The expulsion of teleology from scientific-technical rationality stripped it of most normative elements. So long as ethical and aesthetic principles remain external to technique they appear to intrude impotently on a self-sufficient domain with its own laws and logic of development. Thus nothing is more urgent today than rooting these principles in the structure of technical disciplines as restraints on the deployment of their overwhelming destructive power. Can this be accomplished in a progressive framework? Can normativity be restored within the technical realm without regressive re-enchantment of nature or general impoverishment? These are the questions to which this paper is addressed, not with final answers in hand but programmatically, in the hope of suggesting a new approach.

Technique and World in Heidegger

The place to begin is Heidegger's ontological account of experience, which he calls "worldhood" in an attempt to avoid any hint of subjectivism. Worlds emerge in the human encounter with reality, but that encounter cannot be understood in causal terms because on those terms no world appears but only isolated stimuli and response. "World" must be understood instead as the existential enactment of meaning, not the object of perception. But despite the rejection of a causal account, Heidegger describes the encounter with world in more or less passive terms as a revealing, a disclosure, an opening, not a construction. His language struggles to evoke this enactment, which is taken for granted and indeed must be taken for granted, for everyday life to go on.

These are familiar aspects of Heidegger's early thought, but it seems to me that insufficient attention has been paid the nature of the enactment in which worlds emerge. This relative neglect is I believe due to the entwinement of Heidegger's argument from the very beginning with a phenomenological concept of the technical that challenges philosophy to leave its ivory tower and engage with concrete social reality. His work promises a new basis for understanding human life through a radical reevaluation of the structure and relevance of everyday experience in its technical aspect.

That Heidegger himself failed to fulfill this promise, that his attempts to concretize philosophy are still excessively abstract, that his early vision of the technical later degenerated into a global critique has authorized much evasion and obscurity. And where philosophers attempt to fulfill the promise of

Heidegger's technical turn, they all too often attribute to him intentions that he no doubt should have entertained rather than recognizing the limitations of his actual position. Such appropriation of Heidegger's philosophy begins with the early writings of his student, Herbert Marcuse. I will return to this connection in the second part of this paper.

The infamous Rectoral Address contains an intriguing ambiguity relevant to my argument. The subject of the Address is "Wissenschaft" and its place in the university. In 1933 Heidegger imagined that he could realize his own philosophy through collaboration with the Nazi regime. He hoped to stimulate a reform of the university that would bring its disciplines into a renewed version of the original "Greek" relationship to the world. That relationship he described as one of fearless questioning of reality combined with submission to "fate." Characteristically, he failed to provide any concrete guidelines for accomplishing this in modern Germany. But even while remaining at an ineffectually high level of abstraction, his argument hints at interesting possibilities.

Heidegger quotes a saying attributed to Prometheus that, he claims, "expresses the essence of knowledge." The text reads "techne d'anangkes asthenestera makro," translated as "But knowledge is far less powerful than necessity" (Heidegger, 1993a:31). Note that Heidegger translates "techne" as "knowledge" and thus apparently confounds the know-how of practical making (techne) with the Wissenschaften (epistemai) of university professors. And he insists! In the following paragraphs he rejects the familiar notion that the Greeks idealized disinterested contemplation and writes instead that for them

> "theory" does not happen for its own sake; it happens only as a result of the passion to remain close to what is as such and to be beset by it. On the other hand, however, the Greeks struggled to understand and carry out this contemplative questioning as a – indeed as *the* – highest mode of man's *energeia*, of man's "being at work." It was not their wish to bring practice into line with theory, but the other way around: to understand theory as the supreme realization of genuine practice (Heidegger, 1993a:31-32).

This obscure formulation must have puzzled his audience. Only his own students would have understood what Heidegger meant by these references to techne and energeia and this unconventional explanation of Greek science as dependent on practice. In his contemporary lectures he explains that the metaphysical concept of energeia derives from labor aiming at an essential accomplishment. Energeia is actuality in the sense of the realizing of the work. The fullest actuality of man is the realization of his capacities, his "dynamis," in

"being at work" in the practice of a techne. He argues that it is out of this practice that the sciences emerged at the origins of Greek thought when technical engagement with beings evolved into wonder. Heidegger writes:

> it is clear that this perceiving of beings in their unconcealedness is not a mere gaping, that wonder is carried out rather in a procedure against beings, but in such a way that these themselves precisely show themselves. For that is what *techne* means: to grasp beings as emerging out of themselves in the way they show themselves, in their outward look, *eidos*, idea, and, in accord with this, to care for beings themselves and to let them grow, i.e., to order oneself within beings as a whole through productions and institutions (Heidegger 1994, 155).

In sum, Heidegger appears to be saying that scientific knowledge of the nature of things is not essentially contemplative but grows out of practical craft knowledge.[2] But knowing implies more than making. In knowing, the meaning of what is becomes explicit as idea, essence, and is grasped, Heidegger assures us, in wonder. This respectful attitude lies at the foundation of the sciences and must be recaptured for the university to return to its rightful role in society.

The identification of knowledge and techne is familiar from pragmatism but Heidegger does not reduce truth to consequences. Knowledge is rooted in instrumental activity in the broadest sense but not in that aspect of it that serves mastery of the environment. Technical power worries Heidegger more and more, but at least until the mid 1930s, the *form* of technical practice has a very broad significance for his philosophy. It is the fact that instrumental activity brings forth something prefigured in an image, an eidos, that interests him. In his course on Aristotle's *Metaphysics* he offers such an account of techne, explaining the teleological conception of being as a generalization from craft practice. Everything thus has an essence that prefigures it and so can be known (Heidegger, 1994: 76-77).

Essences, as the guiding principles of techne, are founded in elemental practical coping with the world and appear in the first instance in the structuring of technical practice around right and wrong ways of transforming matter. The essence, as peras and telos, limit and goal, is immanent in the practice of making which responds to the specific privation the materials suffer in their formless condition at the outset of the work. Essences are not in the first instance in the mind as ideas, but in the hands as gestures and in the materials as an obscure striving fulfilled in the finished work. The logic of techne is thus privation and fulfillment.

This is the background to Heidegger's explanation of everyday use in *Being and Time*. There he argues that using is not the implementation of a pre-existing plan but possesses "its own kind of sight." This sight, "Umsicht," identifies significances, meanings, not intellectually but in action. Meaning is thus manifest in experience prior to its propositional articulation, a fundamental phenomenological insight.

There is, however, a danger associated with techne that Heidegger emphasized increasingly as his work matured. Techne imposes limitation on the formlessness of the materials. But in this there is a risk of arbitrariness, of violently imposing a merely subjective order on things rather than disclosing them in their truth. This notion of arbitrariness can be interpreted in two different ways. First, the arbitrary may manifest itself as error, deviation from the essential pattern at which production should aim. Second, culture itself may be conceived as arbitrary. Affirming arbitrariness in this second sense involves relativizing any and all meanings. Heidegger's Greeks were aware only of the first form of arbitrariness. The later Heidegger argued that modernity is based on the second form which now prevails as the technological revealing.

In the technological revealing, no essences are uncovered. The place of meaning is now taken by the plan and so reduced to human intentions. This may be described as hubristic although as the technological system gathers momentum it humbles its human creators by incorporating them into its system. This critique of technology was not explicit in Heidegger's writings until the mid 1930s, but he assumed its main points already.

Heidegger's "reform" of the university was intended to block such arbitrariness by tying scholarship to the limits of a techne. At that time, Heidegger considered statesmen to belong to a superior order of producers.[3] The techne in question was thus the formation of the Nazi state. The university was to maintain its autonomy precisely through subordinating its understanding of the world to the intrinsic necessities and limits of the national restoration brought about by Hitler. In Heidegger's own mind, this was quite distinct from politicizing Wissenschaft by infusing it with political propaganda.

Beyond Heidegger's personal error, what are the strengths and weaknesses of this conception? Heidegger is most convincing in arguing that knowledge is ultimately rooted in the enactment of meanings in everyday practice. This argument against the neutrality and autonomy of knowledge is echoed in contemporary epistemology and sociology. The notion that meanings are to be

found not primarily in the mind as conceptual maps but in action as the guiding principles of practical behavior is especially suggestive.[4]

But there is a puzzling risk of self-referential contradiction in Heidegger's approach. Only in the age of technology is it possible to adopt a synoptic view of the history of being such as Heidegger's. He holds that like all previous humans, we moderns live in a realm of meaning that is given to us through a tradition as access to a world. According to this tradition, there is a world "in itself" that can be known in its truth scientifically, but that is grasped in one or another arbitrary way in a collective subjectivity, a culture. But this view merely recapitulates a technological understanding of being as raw materials subject to a plan. In sum, we can articulate a general theory of the local origin of culture, a "history of being," because we are situated in a culture that understands all meanings as reducible to the subject. Heidegger must have been aware of the reflexive paradox implicit in his position.[5] He attempted to overcome the paradox in quasi-Hegelian terms, the "owl of Minerva" rising at the dusk of modernity. A "new beginning" would place Germany in touch with a new order of meaning beyond the reach of the relativizing consciousness that enables Heidegger to think the limitation of modernity as a specific culture.

What could the new sources of meaning be? Surely not the arrogant strutting of those "Aryan worthies" intoxicated by newspapers and beer whom Nietzsche had already denounced fifty years before (Nietzsche, 1956, pp. 294-295)! Heidegger's essentially dogmatic claim that a new era had begun is untenable, easily refuted by the very modern thought he hoped to transcend. The breakdown of this whole construction led the later Heidegger to a new position based on poetic thinking. But that new position cancels the original reformist intent of his early philosophy. The call for a "free relation" to technology may not imply total resignation, but it certainly is not a program of technological reform.

Marcuse, Lukács, Heidegger

I want to turn now to a further consideration of that reformist intent and Marcuse's relation to it. The reason I focus on Marcuse is not merely biographical. What concerns me is the prevalence of contemporary Heidegger scholarship that struggles heroically with the texts of the master in the interests of some sort of left wing politics. This is no doubt a minority view, but it has interesting advocates. The influence of Derrida and Foucault is important in this con-

nection, as is the plausible analogy between Heideggerian Gelassenheit and some sort of environmental philosophy (Schürmann, 1990; Foltz, 1995). Environmentalist, anarchist, and postmodern interpretations are offered on this basis.

But the improbability of all these interpretations is clear from Heidegger's last interview in which he dismissed democracy and praised the Nazi revolution which, he still claimed, confronted the real problems but in too limited a manner to solve them (Heidegger, 1993a: 104, 111). If there is something of value in Heidegger, as I believe there is, it can only be extracted by sacrificing fidelity to his doctrine. The way to get at this worthwhile contribution is critically, not just exegetically.

This is precisely what Marcuse did during his years as Heidegger's assistant. To some extent the influence of Heidegger continued in Marcuse's later thought as well. In what follows I will try to outline the transformation Heidegger's argument underwent in Marcuse's writings. This cannot be a straightforward procedure since Marcuse reacted so strongly against Heidegger that he substituted similar ideas from other sources for those of his teacher. Heidegger's influence survives as a kind of archaeological stratum underneath these later sources, only occasionally emerging into view.

What was it in *Being and Time* that so excited Marcuse as to inspire him to return to the university as Heidegger's student? He later explained that it was the promise of a "concrete" philosophy (Olafson, 2007: 116). This promise accompanied the rebellion against scientism which took an original turn in the early 20th century. Instead of romantic protest against reason in the name of passion, existential ontologists developed an analytic of first person experience which they interpreted as the foundation of the abstractions in which science consists. For many philosophers, phenomenology was the essential methodological innovation that enabled the turn to a concrete ontology. It was this turn that attracted Marcuse.

What was unusual about Marcuse's situation was his strong political sympathies. He was a revolutionary socialist bereft of party and hope after the failure of the German revolution in 1919. There were many different diagnoses of the sickness of German socialism, but the one that appealed to Marcuse was laid out most persuasively in 1923 in Georg Lukács's famous book, *History and Class Consciousness*. There Lukács introduced the concept of reification to broaden Marx's original critique of market rationality into a more radical critique of scientific-technical rationality as the dominant cultural form in modern capitalist

society. He notes the similarity between scientific knowledge and the laws of the market Marx criticized. The market is a "second nature" with laws as pitiless and mathematically precise as those of the cosmos. Lukács writes, "What is important is to recognize clearly that all human relations (viewed as the objects of social activity) assume increasingly the objective forms of the abstract elements of the conceptual systems of natural science and of the abstract substrata of the laws of nature" (Lukács, 1971: 131).

Like the worker confronted by the machine, the agent in a market society can only manipulate these laws to advantage, not change them. "Man...is a mechanical part incorporated into a mechanical system. He finds it already pre-existing and self-sufficient, it functions independently of him and he has to conform to its laws whether he likes it or not" (Lukács, 1971: 89).

We are not far here from Heidegger's later critique of technology as a universal mode of thought and action in modernity. But unlike Heidegger Lukács envisaged a politics of dereification. As a Marxist he argued that the human reality underlying the reified forms can reassert itself and transform the society (Feenberg, 2005: chap. 4). But reification distorts and obscures the process character of social reality in both theory and practice. Fundamental change requires a shift in perspective.[6]

Lukácsian reification involves an objectivistic misunderstanding of the social world as composed of law-governed things subject to theoretical representation and technical manipulation, precisely the worldview against which Heidegger and Marcuse also protested in their early work. Reading Heidegger, Marcuse discovered a path to an existential formulation of the Lukácsian argument in terms of the concept of authentic action, freed from the social democrats' passive conformity to economic law. This formulation could then be turned to account in addressing the problem of revolutionary consciousness for which the social democrats had neither solution nor, any longer, even concern. Accordingly, Marcuse joined a vaguely Heideggerian conception of individual decision with Marxist social theory. Once the decisive action of the authentic individual is treated in class terms as a collective enterprise, it provides an original account of the revolution as a transforming practice capable of dereifying society and remaking it anew.[7]

The early emphasis on the existential crisis of the individual continued throughout Marcuse's career although in his later work the references to both Heidegger and the proletariat were dropped. The important new element in Marcuse's thought that can traced to other aspects of Heidegger's influence is the critique of

technology, especially in Marcuse's 1964 book *One-Dimensional Man.* With rare exceptions, the extent and nature of this influence has been consistently underestimated or misunderstood by both Marcuse's admirers and critics.

Marcuse's New Techne

Both Heidegger and Marcuse argue that the normative dimension of techne is eclipsed in modern technology. In this early courses Heidegger explained that the knowledge associated with production does not merely concern means but more fundamentally the rightful outcome of productive activity. That outcome, the ergon or finished work, is present in the means and directs them toward the realization of an eidos or essence. Unlike modern technology, techne is not value neutral knowledge but transcends the opposition of ought and is. This contrast returned after the war in Heidegger's "Question Concerning Technology." Greek techne brings forth pre-existing essences and allows them to manifest themselves in the world whereas modern technology imposes plans on a reality reduced to bare raw materials.

It seems likely that Marcuse's understanding of technology was shaped by these concepts and in fact there are several positive references to this aspect of Heidegger's thought in Marcuse's later work (e.g. Marcuse, 1964, 153-154). There is, however, a subtle difference in emphasis. Under the influence of Hegel, Marcuse explained the concept of essence in terms of the role of potentiality or "real possibility." Essences are the highest realization of what appears imperfectly in the world. Thus essences are in some sense ideals, but not for that matter merely subjective. Essences are objects of striving of the things themselves, historical tendencies. In this reinterpretation of Greek ontology, the concept of truth applies not just to propositions but to things, which can be more or less true to their essential nature.

Marcuse argued that the Greeks misread such tendencies naively in terms of the culturally relative assumptions of their time. The modern discovery of the constructive power of the subject stands in the way of a return to such an uncritical relation to culture. This constructive power is now exercised not only in the spiritual domain of culture but materially, through technology, which transforms the environment according to human plans and purposes. Modern society dismisses the essences of antiquity as obstacles to the free exercise of human powers. Technical means are stripped of any relation to an objective "truth" of the object they create. The new norms under which technology stands

are reduced to the formal requirements of domination and, ultimately, of capital as a dynamic force.

This formulation recapitulates in a socially concrete form the basic point of Heidegger's critique of technology, i.e. the radical deworlding accomplished by modernity which shows up in the reification of society to which the individuals are called to submit. The new conformism consists not in obedience to a leader or to customs but more fundamentally in submission to the "facts of life" interpreted one-dimensionally as the only possible organization of a modern society. In so adapting the individuals fall into the objectivistic worship of the given which authentic decision must resist.

Marcuse developed this argument as a historical account of the destiny of reason. This account was shared by other members of the Frankfurt School although only Marcuse proposed a positive alternative. In this tradition the equivalent of Heideggerian techne is what Horkheimer called "objective reason," a reason that incorporates substantive goals (Horkheimer, 1947). The origin of reason in the practical necessities of life is clear in this original objective form. Marcuse could thus argue that reason from the very beginning was rooted in a value judgment, a preference for life over death (Marcuse, 1964: 220). The emergence of modern scientific-technical rationality, Horkheimer's "subjective reason," appears as a reduction of the earlier form of rationality. When substantive goals are removed from the structure of rationality, only means are left: reason becomes instrumental.

This transformation of reason is reflected in the methodology of the sciences and eventually of all the academic disciplines. Reality is analyzed exclusively under those empirical aspects that expose it to calculation and control. The teleological concept of essence is expelled from science; nature is revealed as an object of technology and along with it human beings too are incorporated into a smoothly functioning social machine. This is the basis of the academic world Heidegger hoped to reform with his new beginning. Marcuse rather looked forward to a return of the "objective" dimension of rationality in a future socialist society.

Where Heidegger withdrew from history after his disappointment with Hitler, Marcuse persisted in attempting to rethink the socialist alternative in philosophical terms.[8] To the theme of authenticity as transcendence of objectivism he now added a theory of technological transformation as the material base of socialism. Humane goals must once again be intrinsic to reason, if not in the form of ancient essences in some new form appropriate to the modern age.

These goals cannot be merely subjective but must be disclosed to the subject in the sense that they must have a validating ground that a reason shaped by modernity can recognize and accept. We appear to have returned to Heidegger's problematic of 1933 in search of a better solution than a Führer. Did Marcuse find that solution?

His most explicit attempt to do so was presented in the last chapters of *One-Dimensional Man.* There Marcuse outlined the preconditions of a modern objective reason. He argued that modern science only appears value neutral when artificially separated from its social context. In that larger social context the means it supplies are bound up with the practice and the goals of the dominant social subject. Concretely, value neutrality means the overthrow of all restraints on power. Thus,

> … it is precisely its neutral character which relates objectivity to a specific historical Subject ... Theoretical reason, remaining pure and neutral, entered into the service of practical reason. The merger proved beneficial to both. Today, domination perpetuates and extends itself not only through technology but *as* technology, and the latter provides the great legitimation of the expanding political power, which absorbs all sphere of culture (Marcuse, 1964: 156, 158).

However, Marcuse did not suggest that we abandon modern science and technology. The cognitive advance made possible by the destruction of the old objective reason is undeniable but so is the danger of spiritual and material extermination represented by modern technology unrestrained by any limits.

If subjective reason is not really neutral, neither are rational goals merely subjective. It is possible to restore the unity of ends and means in a modern context. This would be the equivalent of the creation of a modern techne and in fact Marcuse argued that the link between art and craft in antiquity can be restored in a new form. A technology can be devised that pursues idealizing strategies similar to those of art. Misery, injustice, suffering and disorder shall not just be stripped out of the artistic image of the beautiful, but removed practically from existence by appropriate technological solutions to human problems.

Obscure as this abstract formulation appears to be, it corresponds fairly closely with the way we usually think about certain technical professions such as medicine. Marcuse appears to call for a similar professionalization of the whole technological realm.[9] This has implications for technological design since each technical discipline would, like medicine, have an overarching mission. Designs would embody the values implied in that mission and not be

subject to the mere will to power of government and business. This, I believe, is how we can understand his demand that values "operate in the project and in the construction of the machinery, and not only in its utilization" (Marcuse, 1964: 232).This would require the reconstruction of the technical base of society.

> This is the notion of the rupture with the continuum of domination, the qualitative difference of socialism as a new form and way of life, not only rational development of the productive forces, but also the redirection of progress toward the ending of the competitive struggle for existence, not only abolition of poverty and toil, but also reconstruction of the social and natural environment as a peaceful, beautiful universe: *total transvaluation of values, transformation of needs and goals.* This implies *still another change in the concept of revolution,* a break with the continuity of the technical apparatus of productivity which, for Marx, would extend (freed from capitalist abuse) to the socialist society. Such *"technological" continuity would constitute a fateful link between capitalism and socialism, because this apparatus has, in its very structure and scope, become an apparatus of control and domination. Cutting this link would mean, not to regress in the technical progress, but to reconstruct the technical apparatus in accordance with the needs of free men...* (Marcuse, 1970: 280).

But is Marcuse out of the woods with these proposals? Not quite. The attempt to reintroduce a notion of privation to which a rational techne would respond with appropriate remedies implies an ontology Marcuse did not develop. Scientific naturalism is not suited for this purpose, nor is it plausible to return to Aristotle. The alternative at which Marcuse hinted was a phenomenology of aesthetic experience in a very broad sense. But although there are indications in his work of how he might have developed such an alternative, he did not work out his aesthetic in sufficient depth and detail to successfully challenge the pessimism of Adorno or Heidegger.

Instead, Marcuse turned to a rather formalistic argument that relied on the existential validity of the new aesthetic sensibility for at least some marginal groups. The basis of this new sensibility, he believed, was an immanent critique of the society, contrasting its ideals and its achievements. As Marcuse pointed out, this contrast grows ever more scandalous as the rising productivity of technology removes the material alibis for poverty, discrimination and war.

This argument then grounded the new techne in a rational judgment able to supply the criteria of a "transcendent project," a progressive development beyond the existing society. The criteria include technical feasibility at the given level of knowledge and technology, and moral desirability in terms of the

preservation and enhancement of human freedom and happiness. Furthermore, the transcendent project's rationality would have to be demonstrated through a persuasive analysis and critique of the existing society (Marcuse, 1964: 220).

Technology and Lifeworld

Looking back now from the perspective of the new century, Marcuse's general position remains convincing primarily in this last respect. As analysis and critique *One-Dimensional Man* is unsurpassed despite a generation of efforts to elaborate philosophies of "difference" on the basis of French theory and Adorno. The retreat from the concrete represented by these latter sources is distressingly reminiscent of the false promise of concreteness in Heidegger's work.

What has proven fatal to Marcuse's reputation is his hopeful argument for radical social and technical transformation. Yet this aspect of his work is relevant in a new period of crisis and protest largely focused around technical issues such as environmental pollution, energy politics, and the globalization of industrialization and disease. In this and the concluding parts, therefore, I will consider some starting points for continuing the general line of argument Marcuse developed under the contradictory influences of Heidegger, Marxism and the New Left.

Heidegger and Marcuse argued that the understanding of beings in general, what we would normally call "culture," is rooted in the form of the instrumental relation to reality. That form evolves historically and in its latest incarnation takes on a particularly destructive aspect. The danger is not merely physical but concerns the substitution of technological rationality for every other type of thought. The subject in a "one-dimensional society" neither understands its own essential involvement in its world nor the potentialities with which that world is fraught. Understanding this "second" dimension requires a thought freed from narrow instrumental purposes and capable of addressing lived experience in all its complexity.

These thinkers appear to postulate the existence of a culture – modern technological culture – that evacuates the second dimension. In this technological culture, abstract aspects of social processes are isolated and privileged as the ends of action. The pursuit of ends with means, preferably technically efficient means, replaces an understanding of the structure of meaning in which experienced worlds consist. The focus on the means leads to a forgetfulness of mean-

ing and eventually to the lopping off of whole dimensions of the original experience that appear functionally irrelevant. From within technological culture it seems that all that has been lost in the disenchantment of the world is arbitrary prejudices and myths. According to this view modern scientific-technical rationality supplies all the truth human beings can possibly require. The lifeworld is a poor source of knowledge until its givens have been refined to remove illusory subjective elements. Everything, including human beings, belongs to the technical system. Both Heidegger and Marcuse were tempted at least rhetorically to accept such a reductionist vision as accomplished fact while giving it a dystopian twist: the triumph of Brave New World.

Yet ultimately neither believed the experiential realm could be wholly eliminated. Heidegger claimed that behind the functional appearances of modern technology there lies a mysterious revealing of new meanings which are still hidden to us but which may someday be revealed. Marcuse concluded that the very meaninglessness of modern technology situates it within the project of a ruling class. The destruction of all traditional meaning, which is the condition of capitalist technical and economic advance, is simply the other side of the coin of the reinterpretation of meaning in the degraded form of consumer goods.

In his later work, Marcuse, as we have seen, argued for transforming technology itself. He did not share Heidegger's belief that the relationship to technology could be independent of its design. The particular examples Marcuse cites are the assembly line and advanced weaponry. If these technologies remain at the core of modern life, no change in our relation to them can save us. The movement would thus have to overcome not just the cultural, economic and political orders but the underlying technology of destruction, indifferent to nature, human life and the development of human capacities. But Marcuse could only hint very generally at how this would come about and what the new technology might entail.

Because both thinkers faced a world in which no alternative appeared at the technical level proper, they sought sources of resistance in other domains such as Nazi politics or New Left protest. But this is a departure from the ontologically fundamental role technical practice holds in their own philosophies which they did not adequately explain or justify. These thinkers ended up with such unsatisfactory conclusions because they could find no way to return to the realm of everyday technical experience to discover there the enactment of new meanings that cannot be treated as merely arbitrary, that appeal precisely to a

modern ground while pointing beyond the current limitations of modern societies. If we can find a closer connection between politics and technology, a more convincing alternative may appear.

We are in a better position to address this problem than were these predecessors. In Heidegger's and Marcuse's day, it was widely assumed that technical issues should be resolved by experts rather than publicly discussed. Their radical response to these technocratic pretensions was a global critique of technology as such. Both sides in this argument have lost plausibility as a vital politics of technology has emerged around environmental and medical issues, while the rise of the Internet has changed attitudes and opened new avenues for agency in the technical sphere.

Nevertheless, Heidegger's and Marcuse's attempts to restore the cognitive and normative value of the experienced world is still of interest. As in the phenomenological concept of the Lebenswelt, the lived world, so in Marcuse's concept of nature, value and fact are not separate but fused in immediate experience. Our original encounter with nature, both external nature and human nature, is not objectivistic. In everyday practice we always work with "materials" that possess meaning and seek form. Marcuse calls this the "existential" truth of nature, writing, "The emancipation of man involves the recognition of such truth in things, in nature" (Marcuse, 1972: 69).

Elsewhere he carries this phenomenological argument unhesitatingly to the startling conclusion that there are "forces in nature that have been distorted and suppressed – forces which could support and enhance the liberation of man" (Marcuse, 1969: 66). Marcuse was thinking primarily of natural beauty, which he saw as symbol and bearer of peace and happiness, the affirmation of life as a supreme value. Perhaps we can find a less romantic equivalent in those aspects of the natural world that sustain a rich and varied civilization. Some of these are so obvious as to seem trivial – clean air, abundant water, a climate suitable for agriculture and human life – and yet they are being destroyed by uncontrolled development. These benign forces of nature were recognized as such and celebrated by primitive peoples. Respect for such forces is still required from us moderns. It should take the form of less destructive strategies of development.

It would be easy to dismiss these speculations as naïve attempts at re-enchantment of what science has thoroughly disenchanted. But phenomenology is not naively metaphysical. Data of prereflective experience everyone can verify for themselves support the idea of an "existential truth" of nature. The dismissal of the experiential realm as "merely subjective" is ethnocentric as the

discussion of Heidegger in the first part of this paper attempted to show. While there are no obstacles in principle to the indefinite extension of research into nature, the claim that nature as science understands it is the one and only reality has no scientific basis. Experience is not reducible to its natural conditions as a reductionist naturalism would have us believe. Narrow scientism borrows the prestige of real science for a dubious philosophy.

Worlds of experience are contingent in their details but have an essential structure that is presupposed by objective understanding of nature. Heidegger merely alludes to this point which he seems to think is obvious, but it is further developed by Karl-Otto Apel as a "transcendental-pragmatic" grounding of science in practice. According to Apel, science presupposes human action through which scientific data are gathered. Experiments, which create closed domains within which laws can be observed to operate, themselves depend on action. But action is only understandable as such, that is, as meaningful, from a phenomenological or hermeneutic standpoint distinct from that of natural science. If action is reduced to its natural conditions, for example, certain muscular reflexes, it is de-worlded and no longer makes sense. The totalization of science in a naturalistic reductionism would eliminate action and so render the possibility of scientific understanding itself unintelligible. In this sense action is a quasi-transcendental precondition of (scientific) knowledge. Apel thus argues for a "complementarity" of hermeneutic understanding and scientific explanation (Apel, 1984: 63-64).

But Apel's argument is incomplete. His thesis according to which meaningful action is a precondition of scientific knowledge depends on the still more fundamental thesis that the world as the network of meaningful objects is the precondition of action. For action to make sense it must address objects that themselves possess significance. The essential structures of action must correlate with essential structures of objects as they are found in lived experience. The lifeworld extends into the practical realm as a whole and does not concern action alone as appears to be the case in Apel's formulation. But this means that it is not only action which escapes reduction, but objects as well.

This observation has implications for technology which, like scientific experiment, exists on both sides of the line separating the lifeworld from the order of natural causality. Technologies are at one and the same time meaningful within the lifeworld and functional as causal mechanisms. Their two-sidedness is essential to their very being, and is not an external combination of subjective feelings and objective things. Meaning is thus the precondition not just of the

scientific rationality but also of technology's very existence within a lived world.[10]

A phenomenological concept of meaning is found in several Heideggerian analyses of ancient Greek poiesis and more abstractly formulated in *Being and Time*. For our purposes, the most significant proposals concern the role of essence which Heidegger develops in some detail in his course on Aristotle's *Metaphysics*, and which he takes up again in condensed form in "The Question Concerning Technology."

Essences consist in the form and purpose of the materials. But form and purpose are precisely what has been reduced to arbitrary plans in modern times. Yet there is a dimension of essence that retains a deeper validity, that is not subject to arbitrary manipulation. Recall that essences are by nature limitations on the formless materials from which the produced thing is made. As Heidegger writes, "The end which finishes, however, is in its essence, boundary, peras. To produce something is in itself to forge something into its boundaries ... Every work is in its essence 'exclusive' (a fact for which we barbarians for a long time now lack the facility)" (Heidegger, 1995: 118). On this Greek model, no culture can exist without some notion of meaning, that is, as Heidegger describes it here, some limit on the infinite possibilities of action and objects.

Heidegger's notion of essential limits merits further exploration in a modern context. It is here that we encounter the peculiar ingression of objectivity into experience that corresponds to Apel's account of the foundational role of experience in science. Limits emerge in the lifeworld as objective knowledge feeds back into experience, guiding it toward demands for less destructive technological designs. Thus the complementarity of objectivity and experience Apel identifies is not just cognitive but has political implications as well. This has to do with the structure of technical action as it has developed in modern times.

Structures of Action

Technical action involves a hidden oscillation between reason and experience that can be made explicit in a transcendental-pragmatic account paralleling in the practical domain Apel's account of science. This oscillation can be clarified on systems theoretic terms by distinguishing a finite actor from a hypothetical infinite actor capable of a "do from nowhere."[11] The latter can act on its object without reciprocity. God creates the world without suffering any recoil, side effects, or blowback. This is the ultimate practical hierarchy estab-

lishing a one way relation between actor and object. Modern thought takes this imaginary relation as the model of rationality and objectivity, the point at which practice transcends itself in pure theory. But in reality we are not gods. Human beings can only act on a system to which they themselves belong. This is the practical significance of embodiment and implies participation in a meaningful world. Apel notes the implications of our finitude for knowledge, which depends on action for its acquisition. In practice, finitude shows up as the reciprocity of action and reaction. In this domain every one of our interventions returns to us in some form as feedback from our objects. This is obvious in everyday communication where anger usually evokes anger, kindness kindness, and so on.

The technical subject does not escape from the logic of finitude, but the reciprocity of finite action is dissipated or deferred in such a way as to create the space of a necessary illusion of transcendence. Technical action represents a partial escape from the human condition. We call an action "technical" when the actor's impact on the object is out of all proportion to the return feedback affecting the actor. We hurtle two tons of metal down the freeway while sitting in comfort listening to Mozart or the latest pop music. This typical instance of technical action is purposely framed here to dramatize the independence of actor from object. In the larger scheme of things, the driver on the freeway may be at peace in his car but the city he inhabits with millions of other drivers is his life environment and it is shaped by the automobile into a type of place that has major impacts on him.

Heidegger understands the illusion of technique as the structure of modern experience. While objects enter experience only in so far as they are useful in the technological system, the subject appears as pure disincarnated rationality, methodically controlling and planning as though external to its own world. For Heidegger, release from this form of experience may come from a new mode of revealing but he has no idea how revealings come and go. Like Marcuse, I relate the technological revealing not to the history of being, but to the consequences of persisting divisions between classes and between rulers and ruled in technically mediated institutions of all types.

As I reformulate this social version of the technical revealing, it has political consequences. Political protests arise as feedback from disastrous technical projects and designs reaches those excluded from the original networks of control. These protests are often based on scientific knowledge of the devastation caused by technology designed in indifference to human needs. This is the

point at which objective facts enter experience as motives for distrust and fear of technology and technical authority. The subjects become aware of the contingency of the technically structured world on choices and decisions that do not proceed from a supposedly pure rationality. The lifeworld reacts back on technology through the objective contents of knowledge of its side effects.

There have been many attempts to articulate the implications of this new situation. My approach is closest to that of Ulrich Beck. Like him I argue that we are entering a new phase of technological development in which the externalities associated with the prevailing technologies threaten the survival of the industrial system (Beck, 1992). This threat has begun to force redesign of many technologies and changes in the disciplines and training underlying the technical professions. Beck explains the transition from a capitalism based on distinct spheres with little interaction, to a "reflexive modernity" in which interaction between spheres becomes the norm. Multiple approaches and cross disciplinary conceptions increasingly shape the design process in response. He develops the social consequences of the resultant changes while I have focused primarily on the technological dimension of the new phase.

In this phase, what Gilbert Simondon calls "concretizing" innovations emerge designed to accommodate a wider range of social influences and contextual factors.[12] As design is pulled in different directions by actors attempting to impose their differing functional requirements on devices, the winning design strategies are often those that reconcile multiple functions in simple and elegant structures capable of serving them all. Examples abound: hybrid engines in automobiles, refrigerants and propellants that do not damage the ozone layer, substitutes for lead in consumer products, and so on. In the process of developing these technologies environmental, medical and other concerns are brought to bear on design by new actors excluded from the original technological regime. Of course, no small refinements such as these can resolve the environmental crisis, but the fact that they are possible at all removes the threat of technological regression as a major alibi for doing nothing.

The emergence of a radically new technical politics requires us to rethink the basic concept of rationality that has supplied the existing industrial society with its highest philosophical sanction. Heidegger and Marcuse help us to understand the limitations of the prevailing concept. They remind us that the hypostatization of a reason fragmented into specializations and differentiated from a broader cultural and normative context is not inevitable but belongs to a specific historical era, an era that may well be approaching its end. A new

understanding of rationality is possible based not on a return to a teleological worldview in which we can no longer believe but on recognition of the complexity of experiences that have been cast in artificially narrow instrumental schemas. Concrete experience is thus the touchstone of this ontology because it is only there that the world reveals itself in its multifarious and unpredictable connections and potentialities.

From this new standpoint specialization and differentiation will not disappear, but they will be treated as methodologically useful rather than as ontologically fundamental. The resultant breaching of the boundaries between disciplines and between the technical realm and the lifeworld responds to the crisis of industrial society. We may learn to bound the cosmos in modern forms by attending to the limits that emerge from the unintended interactions of domains touched by powerful modern technologies.

This is the form in which the lived world we have discovered in the thought of Heidegger and Marcuse becomes active in the structure of a rationality that still has for its mission the explanation of objective nature. The discovery of a limit reveals the significance of that which is threatened beyond it. This dialectic of limitation is most obvious in the case of threats to human health or species survival. On the one side, the experienced world gains a ground in respect for an object, in this case the human body or a threatened species. On the other side, a concrete technical response is solicited employing the means at hand in new combinations or inventing new ones. From this standpoint no return to a qualitative science is possible or necessary. Modern science objectifies and reifies by its very nature but it could operate within limits standing in for the lost essences of antiquity and like them referring us to an irreducible truth of experience. As we encounter this truth we are reminded of the necessity of restraint.

This must be a productive restraint leading to a process of transformation, not a passive refusal of a reified system. The forward looking Janus face is fundamental and grants hope not by rejecting scientific-technical achievements but by revealing their essential nature as processes in which human action can intervene.[13] Innovative responses to the new limits can serve in the reconstruction of both technical disciplines and technology. To be sure, the process character and full complexity of reality cannot be reflected immediately in the scientific-technical disciplines, but the disciplines can be deployed in fluid combinations that reflect the complexity of reality as it enters experience through humanly provoked disasters of all sorts and through the consciousness of new threats of which we ourselves are the ultimate source.

The goal is not merely to survive but to reconstruct modern technology around a new model of wealth that is environmentally compatible and that draws on human capacities suppressed or ignored in the present dispensation. Marcuse interpreted this in terms of the surrealist "hazard objectif," the rather fantastic notion of an aesthetically formed world in which "human faculties and desires ... appear as part of the objective determinism of nature – coincidence of causality through nature and causality through freedom" (Marcuse, 1969: 31).

Conclusion

In conclusion I would like to summarize briefly the core of the argument the strands of which I have been following throughout this paper. The concept of essence which prevailed until the scientific revolution gave rational form to the teleological structure of everyday experience. In modern times, the differentiation of scientific-technical rationality from everyday experience split the two formerly interwoven domains into fragments of an unattainable whole. Under this new dispensation, meaning and human ends appear subjective, nature and technical means objective, and no mediation reconciles them. An earlier form of rationality based on a teleological interpretation of experience is irretrievably lost except as a reminder of that impossible reconciliation.

Today we confront a world of artifacts so elaborate and complex that it overshadows our lives in every domain. But this world is not shaped by essences. Its structures correspond to the various fragmented disciplines and organizations that make up modern societies. Until recently it was possible to imagine that the fragmented logic of modernity was without negative consequences. No longer. The environmental crisis that results from the interference between the fragmented domains reveals the complexity of the real world, which does not correspond to the boundaries between the historically evolved disciplines and organizations.

The problem reduced to its simplest terms is the collapse of any notion of rational ends once essences no longer guide practice toward sanctioned results. But this formulation masks the deeper question of the nature of these essences in which we can no longer believe. In premodern societies the concept of essence derives from the making of artifacts according to culturally accepted rules. Essences thus join experience as it is lived in a particular society with technically rational practices that are articulated in theoretical knowledge in modern times. The artifacts themselves face in both directions, on the one

hand participating in the normatively informed world of everyday experience, on the other implementing ever more sophisticated rational understanding of nature.

We cannot recover the normativity of technique by a simple act of invention. Norms can only emerge from the shared experience of a community, a world. Worlds in this more or less Heideggerian sense must be understood as realms of practice rather than as a passively observed nature to which "values" are ascribed. Worlds are built out of myriad connections uncovered in the course of everyday experience as Heidegger explains in the suggestive first part of *Being and Time*. These form a horizon within which actions and objects take on meaning. Meanings are not things we have at our disposal, but frameworks, perspectives we inhabit and which contribute to making us what and who we are. Meanings are enacted in our perceptions and practices. They are not chosen but rather they "claim us" from "behind our backs" (Simpson, 1995). What might be the source of such meanings today?

Marcuse argued that reason itself might play this role. Reason has always presupposed a value judgment, the preference for life over death. In ignoring this value judgement, modern societies become unreasonable in their very rationality. Unfortunately, this formulation evokes a rather limited utilitarian framework. I would argue that the elimination of any value judgment from the structure of modern technological rationality, the neutralization of reason, leads to the collapse of the exclusiveness that is a condition for meaningful action. The systematically negative relation of modern technological rationality to meaning is a violation of the requirements of action which, as we have seen, necessarily involves meaning. Technological rationality is thus deficient with respect to the historically evolved concept of reason not only in its indifference to life but, underlying that indifference, in its very structure. Crudely put, when meanings become marketing devices, anything goes and rationality itself is threatened.

What then is the place of meaning in a modern world that has given up on teleology? For the Greeks, telos is the other side of peras. Meaning arises from selection, limitation. What is excluded is the erroneous move that deviates from the essential eidos of the produced thing. Connectedness was acknowledged implicitly in the limitations built into the essences of things. But exclusion in this Greek sense is not just negative; it is the other side of the positive act of production.

For us moderns, who have lost essential discrimination of this sort, another

kind of exclusion is nevertheless possible. This new "peras" must make sense in modern scientific terms but cannot be derived from science alone. We hear about such limits now constantly in popular discourse which emphasizes the importance of respect for the natural balance and human health. These are the norms that should determine modern technological design. The hypothesis hazarded by this paper is that the new limits can take the place formerly occupied by essence as a mediation between experience and rationality. The result would be the restoration of a value-laden conception of rationality, a renewed techne, compatible with modern science and reflecting the exigencies of a coherent world of experience.

Our growing sense of the danger of the reified institutions and ever more powerful technologies bequeathed us by several centuries of capitalist progress confronts us with choices in the re-making of the technical world. Even if they have no scientific status, normative concepts such as human health and the balance of nature do not contradict the cognitive advances of modern science but on the contrary require scientific knowledge to evaluate conflicting claims.

At the dawn of the modern era, thinkers such as Descartes and Bacon expected that the new science and technology would be framed by a wisdom restraining human ambitions. Like technology, wisdom too is located between reason and experience. These two modes of thought require each other. This was the original vision of the philosophers who overthrew ancient teleology. But they were unable to find a substitute for essence capable of serving in its place. Perhaps now, at a decisive turning point along the road they opened, we will be able to realize their vision.

References

Angus, Ian (2000). *Primal Scenes of Communication*. Albany, State Univ. of New York Press.

Apel, Karl-Otto (1984). *Understanding and Explanation: A Transcendental-Pragmatic Approach.* Cambridge, Mass.: MIT Press.

Beck, Ulrich (1992). *Risk Society*. London: Sage.

Feenberg, Andrew (1999). *Questioning Technology*. New York: Routledge.

Feenberg, Andrew (2005). *Heidegger and Marcuse: The Catastrophe and Redemption of History.* New York: Routledge.

Foltz, Bruce (1995). *Inhabiting the Earth*. Atlantic Highlands: Humanities Press.

Heidegger, Martin (1962). *Being and Time*, trans. J. Macquarrie & E. Robinson. New York: Harper and Row.

– (1993a). "The Self-Assertion of the German University", in R. Wolin, ed. *The Heidegger Controversy: A Critical Reader*. Cambridge, Mass.: MIT Press.

– (1993b). "Overcoming Metaphysics," trans. J. Stambaugh, in R. Wolin, ed. *The Heidegger Controversy: A Critical Reader*. Cambridge, Mass.: MIT Press.
– (1994). *Basic Questions of Philosophy*, trans. R. Rojcewicz and A. Schuwer. Bloomington and Indianapolis: Indiana University Press.
– (1995). *Aristotle's Metaphysics* Θ *1-3: On the Essence and Actuality of Force*, trans. W. Brogan and P. Warnek. Bloomington and Indianapolis: Indiana University Press.
Horkheimer, Max (1947). *Eclipse of Reason*. New York: Seabury Press.
Latour, Bruno (1987). *Science in Action: How to Follow Scientists and Engineers through Society*. Cambridge, Mass.: Harvard.
Lukács, George (1971). *History and Class Consciousness*, trans. R. Livingstone. Cambridge, Mass.: MIT Press.
Marcuse, Herbert (1964). *One-Dimensional Man*. Boston: Beacon Press.
– (1969). *An Essay on Liberation*. Boston: Beacon.
– (1970). "Re-Examination of the Concept of Revolution," in A. Lothstein, ed. *All We Are Saying*. New York: Capricorn Books.
– (1972). *Counter-Revolution and Revolt*. Boston: Beacon.
Nietzsche, Friedrich (1956). *The Birth of Tragedy and the Genealogy of Morals* trans. F. Gollfing. New York: Anchor.
Olafson, Frederick (2007). "Heidegger's Politics: An Interview with Herbert Marcuse," in A. Feenberg and W. Leiss, eds. *The Essential Marcuse*. Boston: Beacon Press.
Pinch, Trevor and Bijker, Wiebe. (1989). "The Social Construction of Facts and Artefacts: or How the Sociology of Science and the Sociology of Technology Might Benefit Each Other," in W. Bijker, T. Hughes, and T. Pinch, eds., *The Social Construction of Technological Systems*. Cambridge, Mass.: MIT Press.
Schürmann, Reiner (1990). *Heidegger on Being and Acting: From Principles to Anarchy*. Bloomington and Indianapolis: Indiana University Press.
Simondon, Gilbert (1958). *Du Mode d'Existence des Objets Techniques*. Paris: Aubier.
Simpson, Lorenzo (1995). *Technology, Time, and the Conversations of Modernity*. New York: Routledge.
Todorov, Tzvetan (2007). "Avant-gardes & totalitarianism," trans. A. Goldhammer, *Daedalus*, Winter 2007.
Whitehead, Alfred North (2004). *The Concept of Nature*. Amherst, New York: Prometheus Books.
Zimmerman, Michael (1990). *Heidegger's Confrontation with Modernity: Technology, Politics, Art*. Bloomington: Indiana Univ. Press.

Notes

1. See also my account of the relation between the thought of Heidegger and Marcuse in Feenberg (2005).
2. This notion has its parallel in the derivation of presence-at-hand from readiness-to-hand in *Being and Time.*
3. For an interesting discussion of such notions, see Todorov (2007).
4. As practical enactment, meaning has a "material" dimension that might be explored in a phenomenology of technical practice and technology. This has implications for the discursive turn in contemporary philosophy. So long as reality is understood as structured by or like a language, it is difficult to account for the passive aspect of knowing. The failure to take into

account the resistance of the object and the facticity of the subject leads discourse theory to an implausible relativism. But if meanings are understood as enacted in a practice, they cannot be merely subjective but must entertain a relation to a materiality of some sort (Angus, 2000: 13). Developing this approach would make sense of the moment of receptivity in such Heideggerian notions as disclosure.

5. A similar contradiction haunts "post-modernity," an era which can only open under the horizon of a modern temporality it professes to reject.
6. The difference between reification and dereification is nicely illustrated by Bruno Latour's notion of the Janus face of science: science in the making and science made (Latour, 1987: 4). These two "faces," the glance into the future and the backward glance toward the past, correspond to an understanding of the social world as a process in which human action plays a role and the reified society that results from that process, standing before the spectator as a fixed and finished objectivity.
7. Walter Benjamin aimed at a similar goal through an appropriation of religious notions rather than philosophical ones, but the result was a comparable recovery of the moral intensity of the revolutionary mission in contrast with the rationalistic scientism of the prevailing social democratic ideology.
8. Heidegger writes, for example, in *Overcoming Metaphysics* that "No mere action will change the world," and in his last interview he resists the suggestion that politics holds out hope and endorses "thinking," which he claims is "not inactivity but is itself the action which stands in dialogue with the world mission" (Heidegger, 1993b: 89; Heidegger, 1993a: 110). No doubt sympathetic readers of Heidegger will disagree with my characterization of such statements as "withdrawal." Yet I find no evidence in any of Heidegger's texts that he seriously envisaged a reform program. The conclusion to Michael Zimmerman's book on Heidegger reviews many attempts to understand the later Heidegger's view of technology and concludes persuasively that we must criticize his "presupposition about the extent to which human beings are incapable of resisting and developing alternatives to that [technological] disclosure" (Zimmerman, 1990: 268).
9. It might be objected that professional organizations have their own narrow interests and are easily manipulated by political or economic power. Obviously what is interesting about this model is not its current institutional form but its cognitive structure. Professionalization by itself has no power to solve the problems of society. Its significance depends on the context in which it functions.
10. This is the import of the instrumentalization theory explained in more detail in Feenberg (1999: chap. 7).
11. The implied reference is to the concept of a godlike "view from nowhere." If it were not too cute, one might rephrase the point here as a "do from knowhere," i.e. action understood as just as indifferent to its objects as detached knowing.
12. See Simondon (1958: chap. 1) and Feenberg (1991: 191ff). Simondon illustrates his concept of concretization with examples of politically neutral innovations such as the air-cooled engine, which combines cooling with containment through the design of the engine case, two functions in one structure. I have modified his approach to take into account what we have learned from social studies of technology about the social forces behind technical functions. For example, Pinch and Bijker show how the inflatable tire enabled an inherently more stable but slower bicycle design to overcome its disadvantage in bicycle racing while retaining the stability that made it attractive for transportation (Pinch and Bijker, 1989: 44-46). Two different social groups, young men interested in speed and ordinary riders engaged in everyday usages, were reconciled in this innovation.

13. It is discouraging to note that such reflections are often criticized as "optimistic." Fundamental historical transformations are not subject to calculations of probability. Dogmatic pessimism is as thoughtless as its contrary, uncritical optimism. Neither attitude is helpful in understanding the contradictory process of technological change we are witnessing. For that, analytic tools rather than attitudes are required. What the analysis shows is a convergence of increasing public demands for better technology and a new conception of technology as social and responsive to a wide range of constraints. Although by no means powerful enough to prevail at this time, these trends cannot be ignored.