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## **Function and Meaning: The Double Aspects of Technology**

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**Abstract:** This paper traces the theoretical background to the split between function and meaning in the modernity theories of Marx, Lukács, Weber and Marcuse. It then discusses attempts to overcome the split in the recent philosophies of technology of Simpson and Borgmann. These attempts fail but help to focus the issue. A discussion of contemporary struggles over information technology offers a more hopeful perspective on a possible resolution of the split and suggests a new look at Heidegger's phenomenology of action. The conclusion of the paper shows that Heidegger offers resources for addressing the relation of function and meaning which he himself did not develop.

### I

Every new automobile and computer is equipped with an operating manual. These manuals explain the functions of the device they describe and how to use it. They are apparently exhaustive, that is, once you have understood the device on their terms, it seems you understand it fully. But of course there is more to say, lots more. Automobiles and computers belong to a social world in which they play a complicated part. They are linked to so many other features of that world it is impossible to explain them all, to grasp the totality of their involvements, some symbolic, others causal. A few examples illustrate this complexity. Automobiles shape urban designs, they signify the status of their owners, they are polluters, and so on. Computers similarly transform intellectual property regimes, alter the relations between individual self-expression and the mass media, overcome various types of social isolation, and so on. One could continue these lists ad infinitum. We need a term for signifying this wider range of involvements. I will call it the "meaning" or "significance" of technology.

Philosophers have shown an interest in the relation between the socially determined functions of devices and the natural causality that enables them to "work." They have discovered that this is a more complicated relation than it at first appears. My subject is complementary to that one and still more complicated. I want to understand the connection between the strictly functional dimension of a device such as one finds in an operating manual and its social meaning. This is the question to which this paper is addressed, however, the path I will take in answering it is quite different from the analytic approaches familiar from the established study of function. There is a good reason for this difference: the relation between function and meaning is not primarily a conceptual problem but strikes at the heart of modernity as a unique social formation. It raises the question of how the dominant paradigm of knowledge in modern societies relates to the dimension of meaning in the sense I have given the term. I will therefore begin with some considerations on this aspect of the problem.

### II

Modern societies understand themselves and the world in terms of a stripped down functional logic, freed from sentimental and teleological accretions. This has enabled them to create effective technical means of controlling the natural world and markets which support

unprecedented economic growth. The human personality itself is a collection of functions that are maintained when they break down by more or less efficient medical, psychological, and social interventions.

The attempt to generalize functionality as a culture, to found a civilization on it, is so bizarre that it commands our attention once it is noticed. This is the dystopian paradigm of modernity in the 20th century. The critique of this astounding project in thinkers as diverse as Weber, Lukács and Heidegger, Marcuse, Habermas and Foucault, should also command our attention. It points the way to a new current of social theory, a critical theory of science and technology grasped not as a specialized activity but as central to social life.

I would summarize the central insight of this current as the belief that functional understandings replace more complex meanings in the dominant culture. But before elaborating on this proposition, I must deal with an objection. Recent philosophical writing on function points out that it has a hermeneutic dimension. To recognize a function is already an interpretive act. A hammer is useful only insofar as it is recognized as such. This seems to confute the claim that modern societies are hostile to meaning. But this is to confuse two different definitions of the word "meaning." Anticipating my conclusion, I will argue that a bare minimum of meaning necessary to use a tool is always an abstraction from a broader range of connotations and connections possessed by any object in its social context. The abstraction is of course a useful one, but it is not the whole story. A society which attempts to restrict the understanding of meaning to the bare minimum is different from one that admits the relevance of its whole range.

The influential Weberian analysis of this distinction is based on what is called the "differentiation of cultural spheres." Applied to science, technology and management, this is the social ontological equivalent of the epistemological notion of pure rationality. It asserts the effective institutional separation of functional aspects of objects from their broader significance in their social context. Means and ends are no longer united conceptually and practically but have been broken apart. The premodern notion of "essence," with its teleological conception of meaning that embraced a wide range of connections, gives way to a narrow rationality organized around a modern notion of causality.

The methodological basis of this Weberian view originated ultimately in Marx who discovered that the market has a unique rational form imposed by sundering capitalist economic exchange from tradition, religion, and politics. The larger context of use value, which situates objects within the way of life to which they belong, is replaced as an effective basis of economic action by the narrow concept of exchange value. Marx also showed that apparently "differentiated" and autonomous market rationality is tied to the rise of a specific class and creates a class biased society. Neutral rationality and class bias are conjoined in the market.

Although Weber was Marx's most influential if by no means orthodox follower, he focused on the notion of autonomization and ignored the critique. Only later, in the 1920s did Lukács recover Marx's critical theory of rationality. Following Weber, Lukács generalized the Marxian critique of market rationality to cover the whole surface of modern capitalist society, technology, administration, the media, and so on. This is the famous theory of reification which revolutionized Marxism, if not capitalism, and bore fruit in the Frankfurt School, influencing also directly or indirectly Heidegger and many other critics of modernity. Lukács offered the first version of an argument according to which behind modernity's apparently autonomous, value neutral rational systems lie power relations of a new type. The differentiation of rationality from other cultural spheres is simultaneously the subjection of society as a whole to capitalism.

Lukács 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. Like the worker confronted by the machine, the agent in a market society can only manipulate these laws to advantage, not change them. Lukács takes over Weber's analysis of bureaucratic and legal systems which reveals a related formalistic paradigm at work. He argues that capitalism reorganizes society around the kinds of abstractions characteristic of modern science and technology.

His position depends on his critique of the paradigmatic role of mathematical physics in the structure of modern knowledge and social practice. Since the 17th Century, physical law has been the model for all true knowledge and effective rational action has been identified with the kind of technical manipulation that can be based on such law. As 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. And also, the subject of this 'action' likewise assumes increasingly the attitude of the pure observer of these--artificially abstract--processes, the attitude of the experimenter.<sup>1</sup>

These laws are formal universals, abstracted from all specific time-space coordinates and from the developmental process of their objects. They isolate the functional aspect of social objects through which they can be controlled technically. Their cognitive universality promises equally universal technical control of all aspects of nature and society. But insofar as they are purely formal, they are incapable of comprehending social practice and the ever new historical contents it produces. Resistances testify to the living human content that cannot be fully accommodated to the reified forms. Lukács found in class struggle the exemplary instance of this dialectic of reification and the life process.

Lukács analyzed this dialectic in terms of Hegel's critique of Kant's notion of formal-analytic rationality, also based on the model of physics. He transposed the Hegelian critique into the social realm, and identified correspondences between it and the Marxian critique of capitalist market rationality. The Marxian critique was thus raised to the highest level of abstraction and became the basis for an alternative cognitive paradigm.

This is the background to Marcuse's critique of one-dimensional society. The fact that Marcuse did not cite Lukács in his later works, I believe, due to the uptake of these ideas by the Frankfurt School. By the post-World War II phase of his career, Marcuse could take for granted the basic Lukácsian approach to the understanding of the relationship between capitalism and science and technology. However, there is a second partially hidden source of Marcuse's thought in this period: Heidegger's late critique of technology.

Heidegger argues that the modern world is a sum of resources, raw materials and system components. Nothing any longer has its own inner principle of movement, its own essential core of being, but rather everything is exposed to transformation to serve a role in the technical system. Objects are ripped from their contexts and reduced to their useful properties. These decontextualizations and reductions are inherently one-sided and violent. In this respect modern technology differs from craft work in which a pre-existing essential form embracing a wide range of values and meanings is realized by the craftsperson in materials conceived as predestined for the work. Instead, modern societies impose plans on passive materials. Marcuse's approach is shaped by this Heideggerian theory of the enframing, and

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<sup>1</sup>The passivity of the experimenter to which Lukács refers is only apparent: The experimenter actively constructs the observed object but, at least in Lukács's view, is not aware of having done so and interprets the experiment as the voice of nature. While Lukács does not criticize the epistemological consequences of this illusion in natural science, in the social arena it is defining for reification. Georg Lukács, *History and Class Consciousness*, trans. R. Livingstone (Cambridge, MA: MIT Press, 1971), 131.

the contrast between ancient techne and modern technology on which it is based

Interestingly, the two critiques, that of Lukács and that of Heidegger, converge around several basic themes that reappear in Marcuse. These are:

1. The emergence of scientific-technical rationality as a dominant cultural framework;
2. The neutrality of this formalistic paradigm of rationality, i.e. its differentiation from meanings and values circulating in the lifeworld;
3. The predominance of technology over every other relation to reality;
4. The consequent loss of an authoritative cognitive grasp of significant aspects of the world;
5. The potential for catastrophe implicit in this limitation of the dominant culture to technical manipulation.

Naturally, the way in which Lukács and Heidegger develop these themes is quite different, but in Marcuse's appropriation a kind of synthesis is achieved. The central notion of this synthesis is the paradox of value neutrality which appears to isolate science and technology from the social while in reality it integrates them to it in a new way. This is the basis of Marcuse's critique of what he calls "technological rationality," a form of rationality that grasps its objects on purely functional terms without presupposing any goal except its own application and extension.

In chapter six of *One-Dimensional Man*, Marcuse writes, "This interpretation would tie the scientific project (method and theory), *prior* to all application and utilization, to a specific societal project, and would see the tie precisely in the inner form of scientific rationality....It is precisely its neutral character which relates objectivity to a specific historical Subject—namely, the consciousness that prevails in the society...."<sup>2</sup> Marcuse's approach, as exemplified in these passages, is based on the notion that the differentiation of modern scientific-technical rationality is linked to domination. Neutrality is just the reverse side of the insistence on quantifying and controlling all objects indifferent to their own inherent potentialities. Other forms of action associated with artistic production, craft, the care of human beings and the cultivation of nature, which are based on a relation to the potentialities of their objects, do not offer the prospect of full control and so are dismissed as prescientific or irrational.

Why is neutrality specifically linked to the project of domination of capitalism? Technological production breaks with the past and all the restraints it placed on the pursuit of productivity and profit. Traditional forms of knowledge are too closely integrated to the very lifeworld which capitalism must destroy in the course of its advance. They condense cognitive and valuative dimensions in ways that block technological rationalization, for example, by limiting the exploitation of labor or the natural environment, or preventing the optimization of resources and land.

Scientific-technological knowledge is adapted to the pursuit of power by its selective focus on quantitative aspects of its objects through which they can be broken down and transformed. Organic and essentialist paradigms of knowledge that presuppose some sort of teleology have no place here and give way to a mechanistic approach based on the measurable attributes of things. The neutrality of modern knowledge is thus both real and unreal, breaking the chains of tradition only to enter the prison house of power.

Marcuse's application of the reification/enframing thesis he derived from Lukács and Heidegger leads to the demand for a restoration of meaning through a transformation of the

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<sup>2</sup> Herbert Marcuse, *One-Dimensional Man* (Boston: Beacon Press, 1964), 156-59.

paradigm of knowledge and the technology that depends on it. Marcuse calls for radical technological transformation:

Only if the vast capabilities of science and technology, of the scientific and artistic imagination direct the construction of a sensuous environment, only if the work world loses its alienating features and becomes a world of human relationships, only if productivity becomes creativity, are the roots of domination dried up in the individuals. No return to precapitalist, pre-industrial artisanship, but on the contrary, perfection of the new mutilated and distorted science and technology in the formation of the object world in accordance with “the laws of beauty.” And “beauty” here defines an ontological condition—not of an *oeuvre d’art* isolated from real existence...but that harmony between man and his world which would shape the form of society.<sup>3</sup>

Technologically instituted meanings are required both for human life to make sense once again and as cognitively valid guides to improving technological processes that threaten human wellbeing and survival. But Marcuse insists that this restoration must not take the form of a return to premodern modes of thought. A “qualitative physics” is excluded at the outset. Instead, he promises a kind of synthesis of art and science, an aestheticization of technology that would bring values into the design process as quantifiable parameters.

This development would depend on the emergence of an “aesthetic *Lebenswelt*,” a new structure of experience encompassing aesthetic criteria. Aestheticized perception would embrace functional aspects of objects in the larger framework of their relation to life as a value. Instead of a purely empirical understanding of objects based on modern scientific-technical rationality, or a teleological notion of essence, articulating the place of objects in a traditional form of social life, an imaginative grasp of objects would locate them in a freely chosen way of life oriented toward peace and fulfillment.

While provocative the rather vague positive outcome of Marcuse’s persuasive critique is bound to be disappointing. He never worked out the alternative satisfactorily although he developed a convincing diagnosis of the problem. The impression of pessimism and indeed dystopian despair left by his contribution is due in large part to the disproportionate effectiveness of the critique relative to the rather weak positive perspective on the future.

### III

The philosophy of technology has encountered the very same question that preoccupied Marcuse, namely, how can meaning be restored in the context of a civilization based on a paradigm of rationality for which only causes and functions are real.

Albert Borgmann and Lorenzo Simpson, two philosophers influenced by the later Heidegger, have addressed this question in their writings.<sup>4</sup> In his later work Heidegger called for a “free relation” to technology. This alternative to a technological civilization would not require Marcuse’s transformed technology but rather a change in attitude toward technology as we know it. Presumably, if we could use technology without interpreting all of reality in technological terms, we could enjoy the best of both worlds, a world of functional efficiencies and a world rich in meaning.

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<sup>3</sup> Herbert Marcuse, *Towards a Critical Theory of Society*, ed. Douglas Kellner (New York: Routledge, 2001), 138-39.

<sup>4</sup> Albert Borgmann, *Technology and the Character of Contemporary Life* (Chicago: University of Chicago Press, 1984); Lorenzo Simpson, *Technology, Time, and the Conversations of Modernity* (New York: Routledge, 1995).

Simpson and Borgmann appear to be working with Heidegger's program. They hope to restore and validate the concept of meaning through a loosely phenomenological strategy. They address two problems associated with this project: first, the lack of rational grounds for culturally general meanings, and second, the problem of consensus in a postconventional society. Both Simpson and Borgmann reject the relativistic refusal of local meaning in terms of some absolute standard of rationality they deem inappropriately applied to culture. They also reject the notion that cultural differences in modern societies can be adequately represented as differing concepts of the good. This supposed "good" is a matter of opinion rather than the articulation of a way of life and as such it is subject to infinite and arbitrary variation. They agree with Lukács, Heidegger and Marcuse that there *is* a very definite consensus around a way of life in technologically advanced societies. This consensus is not located at the level of opinion but at the practical level, where technology shapes a common framework of experience and action. Simpson and Borgmann argue that a desirable way of life will sustain human relations and community independent of the technological fixation of modern societies.

Simpson's and Borgmann's critiques are based on the distinction between function and meaning. They argue against the overestimation of the former at the expense of the latter. Today, individuals commonly talk as though the objects by which they are surrounded were essentially functional. Indeed, they even extend a functional understanding to themselves and their human relations. This is the sociological crux of the one-dimensionality thesis. Such an understanding cannot be said to be false, but it is certainly partial.

A purely functional understanding is encouraged by the existence and prestige of technical disciplines in modern societies. The transportation function of the automobile is of special concern to automotive engineers. They are obviously justified in narrowing their focus in their work. But there is a sense in which an ordinary non-professional interpreter who understands the automobile exclusively in terms of its function adopts the engineers point of view in an inappropriate context. There is a risk that the legitimate limits of the engineer's standpoint, which open up a realm of technical knowledge, may become misleading obstacles to broader understanding for the theorist, the user and the citizen. Yet something like this confusion is implicit in much discussion of technology, and indeed in everyday attitudes as well.

The intellectual heritage of this type of argument should be clear by now. The differentiation of society has enabled function to be distinguished from the concrete relationship of artifacts to social life. One-dimensionality results from the attempt to totalize a functional view of the world, denying the residue of meaning excluded by the differentiation of function. The effectiveness of this totalization is not a theoretical but an empirical question. In Marcuse's view as in the views of Simpson and Borgmann, it is sufficiently effective to suppress awareness of the most important "dimension" of social life, the meanings or potentialities that enable humane understanding and self-understanding, and, Marcuse would emphasize, social progress.

Lorenzo Simpson addresses this problem as the reduction of "meaning" to "value." Values as he defines them are simple ends or goals. They can be abstracted from the complex web of meanings in which they emerge in actual life and represented independent of that context. Such abstractions have their uses, but when they are substituted for the larger framework of meaning, the results are dispiriting.

Meanings are built out of myriad connections between experiences and spheres of life. They are not definite, bounded things we have at our disposal, but structures or frameworks which 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." Purpose is only one aspect of the phenomenon of meaning, but it can be isolated and

privileged as the significance of the whole. The technologies that mediate the achievement of purpose then appear peculiarly central. The pursuit of ends with means, preferably technically efficient means, replaces an understanding of meaning. The focus on the means leads to a forgetfulness of the complexity of the structure of meaning and eventually to the lopping off of whole dimensions of the original experience as they appear irrelevant to maximum efficiency.

Simpson points out a second consequence of the reduction of meaning to value. Structures of meaning belong to a way of life. They can be justified only within that framework, by reference to each other and to the general virtues of the way of life in question. Values, on the other hand, seem arbitrary unless justified by arguments with rational appeal under any and all conditions. But such arguments invariably fail and so the values-perspective leads directly to a relativism that devalues the idea of the good life generally.

Simpson argues that the values perspective presupposes an absolutely detached observer. But the “death of God” is also the death of an absolute knower, uninvolved in any social world and tradition. Simpson writes,

What happens in such a transformation of meaning into value? As meaning becomes thematized as value, the manifold connections which operate in part ‘behind our backs’ and which, through informing and shaping our experience, predispose us to experience in a characteristic way, are transformed into premises. The validity of these value-premises, apart from the referential anchoring in the meaning which gave rise to the value, stands or falls with the rational evaluation of those premises. Our inability to provide *purely rational* foundations for such premises, in abstraction from the meaning that gives them point, results in our inability to experience as binding in a nonarbitrary way. That is, such values *qua* values, that is, in isolation from meaningful practices, cannot claim us.<sup>5</sup>

If the position of the participant is privileged rather than that of the outside observer, relativism is avoided by reference to the internal significance of the meanings that circulate in a way of life. Those meanings do not have a compulsory evidence; they can be thematized and criticized. But the exercise of critical intelligence is a moment within the way of life, not escape beyond any and all involvement. Criticism does not automatically devalue meaning in general, but enables a more refined and appropriate relation to meaning in the particular situation of the participating individual. In sum, experience is not transcended in knowledge but forms its horizon. Simpson calls this a “*sittliche* account of rationality,” referring to the Hegelian notion of value as immanent in the way of life of the community rather than speculatively constructed in abstraction from any involvement.<sup>6</sup>

Unfortunately, Simpson does not see that the very reasons he adduces for insisting that values not be disengaged from their background in meanings apply to technologies as well. Technologies, considered apart from their context, are just as abstract as goals artificially isolated from the framework within which they are pursued. As a result, Simpson’s account is vitiated by an unconvincing opposition between technology and meaning. Simpson distinguishes on several occasions between a technological mentality and actual technologies, but he fails to locate his critique clearly on one or the other side of the line between them (Simpson, 1995: 8).<sup>7</sup> Thus he recognizes that a different cultural environment would generate different technologies and yet he also wants to insist that the properties of technology he

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<sup>5</sup> Simpson, *Technology, Time, and the Conversations of Modernity*, 47.

<sup>6</sup> *Ibid.*, 131.

<sup>7</sup> *Ibid.*, 8.

criticizes constitute a “residue” characteristic of technology in general<sup>8</sup>. Unfortunately the residue seems so loaded with undesirable features it is incompatible with benign alternatives. Meaning then shrinks to the margins of his conception of modern life, repelled by the very technical means on which it depends today for its context and realization.

Borgmann’s argument is similar. He contrasts a consumer oriented way of life with an alternative organized around what he calls “focal things” in something like the Heideggerian sense. For Heidegger the concept of the thing refers not merely to an existing entity but to the gathering power of the objects around which the rituals of everyday life are organized. Things “thing” according to Heidegger in the sense that they lay out the framework of a local world within which relationships and identities are formed. In that world individuals are active participants rather than passive consumers, although Borgmann insists that their action is not arbitrary but is shaped by the possibilities opened by the things around which it is organized.

Borgmann believes that we have become so obsessed with the acquisition of commodities that we have lost touch with things in this Heideggerian sense. Technology teaches the sharp difference between means and ends where formerly each implicated the other. The complex involvements of individuals with others and with nature of an earlier time, when activities were less effectively mediated by technology, give way to hollow technical control. “Devices...dissolve the coherent and engaging character of the pretechnological world of things. In a device, the relatedness of the world is replaced by a machinery, but the machinery is concealed, and the commodities, which are made available by a device, are enjoyed without the encumbrance of or the engagement with a context”.<sup>9</sup>

Consumer society is made possible by a technology sufficiently advanced to provide abundance. But the role of technology is not innocent. It is not merely a means to extrinsic ends. The ready availability of technological means to specific types of satisfactions tends to bias socially sanctioned desires toward just those satisfactions. Facility and convenience exercise a hidden tyranny which Borgmann calls the “device paradigm.” A whole way of life is thus implied in technology and the consensus it organizes practically is difficult to criticize much less to challenge and overcome. “Technology,” he claims, is “the new orthodoxy, the dominant character of reality”.<sup>10</sup>

Meaning arises from engagement with focal things, things that exercise the gathering power to constitute worlds. Such things may be celebrations or occasions as well as objects. They require effort and engagement, a practice “that can center and illuminate our lives”.<sup>11</sup> They develop the relationships and skills of those who engage with them. They provide a focus from out of which to experience a context rather than supplying a commodity with efficiency and ease. Borgmann readily admits that focal things are not subject to proof or justification in any scientific sense. A “deictic” discourse can however point to the features of the world that engage our focus. In deictic discourse we can testify to the importance of the focal things in our lives and bring them to the attention of others with the hope of engaging them too in their gathering power. This notion resembles the Kantian “reflective judgment” which is also a testimony and an appeal based on an implicit concept of human nature rather than an absolute ground.

Like Simpson, Borgmann wants to withdraw from technology into activities on the margins, but he too formulates his program in ambiguous terms. Borgmann rejects regression

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<sup>8</sup> Ibid., 174-75, 182.

<sup>9</sup> Borgmann, *Technology and the Character of Contemporary Life*, 47.

<sup>10</sup> Ibid., 189.

<sup>11</sup> Ibid., 4.

and claims that a renewed emphasis on focal things will enable us to rectify our relationship to technology. Thus technology as such is not the problem but rather the device paradigm which frames life as the application of efficient means to the pursuit of goals abstracted from a context of meaning.<sup>12</sup> Yet at the end of his book, Borgmann calls for a “two sector economy” in which technology as device will coexist with craft production. This seems to imply that technology is after all the problem and that bounding it is the solution. Once again the argument wavers between condemning the technological mentality and condemning technology itself.<sup>13</sup>

#### IV

Marcuse argued that fundamental change in technology must be an aspect of fundamental social change. On his terms a return to focal things would imply not only a new attitude toward technology but also new technology. Although his reflections on this prospect were too vague to carry conviction, there is evidence that something like this process of change has already begun in small ways. This is especially clear in the case of the Internet. Not only has the Internet served as a scene on which new forms of sociability have been created, but users have played an unprecedented role in shaping and reshaping the technology. This example is important for revealing new forms of dialectical interaction between technology and the underlying population. We do not return to Lukács’s vision of class resistance to reification with this example, but nor are we locked into a Heideggerian enframing. Marcuse’s hopeful speculation appears relevant in a general way to this case.

Sociability was not in the original plans of the Internet’s military sponsors. It was intended to solve technical problems in time sharing on mainframe computers and to transmit official information between the government and contractors on university campuses. In addition it may have also played a role in plans for a redundant communication system able to survive nuclear warfare. But early in its history a graduate student placed a small email program on the system and soon human communication became one of its most important features. His intervention responded to an interpretation of the system different from that of the military. He looked beyond its use for efficiently distributing computer time to its communicative potential.

The shift in perception implied in such interventions was explained to me by a vice president of the Digital Equipment Corporation in the early days of personal computing. At that time human communication on computer networks was slowly emerging alongside standard usages, much to the surprise of computer professionals. The vice president said, “We were networking computers and we suddenly realized that we were not just connecting the machines but also the users of the machines.”

I encountered several similar moments of realization in the early history of computer networks, enough to describe a pattern. For example, the French Minitel system connected millions of users in the early 1980s, long before the Internet was opened to the public. It was originally intended to be an information system delivering official data and news to dumb terminals, called “Minitels.” The purpose of the system was clearly articulated by the government: to promote the entry of France into the “information age.” But the system was very quickly hacked by users who converted it into a means of human communication. They added instant messaging to the system which exploded its original purpose and introduced an entirely new one: the pursuit of dates and sex. Of course information was still available, but

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<sup>12</sup> Ibid., 200.

<sup>13</sup> Ibid., 220.

the meaning of the Minitel was irrevocably transformed by the revelation of its social potential.

This basic reinterpretation of the nature of computer networks made possible a long history of user generated innovation that continues to this day on the Internet. The essential idea behind many of these innovations, so obvious but so difficult to realize, is the purely mediating role of the technology in social applications. Operations that depended on holding inventories of goods failed for the most part, but those that simply connected people to each other and to pre-existing information have been wildly successful.

This mediating role is not, however, transparent. For a connection to be made a context must be supplied. That context positions the users to take specific types of initiatives, for example, to seek personal communication or group communication, dates or information, and so on. Constructing these contexts successfully is not a simple matter and no engineering manual contains the knowledge required. This is because contexts are in effect virtual “lifeworlds,” frameworks of meaning within which affordances emerge.

These lifeworlds are of course drastically simplified compared to the real thing. But they are not reducible to pure means. They are not tools but environments within which the user moves and works. Consider, for example, email programs such as Eudora and Outlook. The division of the interface into three “panes,” one for titles, another for content, and a third for “mailboxes” constructs a specific temporality. The user is called on to assign connections and priorities. By classifying messages according to various criteria and placing them in mailboxes, she constructs a usable past. By reviewing the title pane and responding to the important communications, she enters her future. The simplicity of the interface belies the complexity of the practices it invites and facilitates.

Still more interesting are the lifeworlds that emerge around group communication on computer networks. Contrary to journalistic hype, these practices do not date from the creation of Web 2.0. The earliest forms of group communication were asynchronous bulletin boards and computer conferencing programs that enabled users to send messages to a shared file instead of to personal addressees. Long before the Internet was open to the public, people were conducting business meetings, social gatherings, and discussing hobbies, illnesses and politics on various computer networks. Of course these discussions lacked many Web 2.0 features, but the all important connection to a group was available.

Within this framework users employed language to construct identities and virtual worlds oriented toward their interests and concerns. They established a communication model at the outset by stating the kind of meeting in which they were engaged. They bounded the group more or less effectively with software or communication practices. They constructed a past and future through techniques of archiving and mutual response. As a result of these activities, computer networks became environments within which communities form and creative activity goes on.<sup>14</sup>

These examples of human communication on computer networks show that the emphasis of critique should be less on features of technology as such or the ills of consumerism and more on the problem of agency and the norms under which agency is exercised. Recognition of the value of human communication is not merely a matter of opinion but activates individuals in new ways that belie the pattern of “technology” as it has been understood by the critics.

We have seen such a recovery of agency in the environmental movement as well as with the Internet. Environmental protests have led to significant changes in technology and

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<sup>14</sup> Andrew Feenberg and Darin Barney, eds., *Community in the Digital Age* (Lanham, MD: Rowman and Littlefield, 2004).

shattered the myth of technological determinism and its associated technocratic ideology. We know now that we are responsible for our own technology and its consequences. An older understanding of technology as a hidden cornucopia managed by experts is giving way to a new sense of technology as a terrain on which human initiative is exercised in the interests of survival and progress.

These new expressions of agency in the technical sphere respond to experience with technologies. The innovators in the case of computer networks and the environmental protestors react to an unsatisfactory situation in which they find themselves. They reinterpret that situation in terms of insights available only outside the mainstream of technological development among users and victims. In Heideggerian terms one could say that they encounter their “world” in the light of potentialities unsuspected by those who first constructed its elements. Innovation is thus not just the discovery of new uses but also of new worlds in which the uses emerge. Marcuse’s notion of a normatively informed perception is relevant to the case. Although aesthetics may not be the right term under which to classify the norms involved, clearly innovation emerges from discontent with the given and the projection of new life affirming possibilities of the sort Marcuse advocated.

## V

This brief sketch of the role of agency in information technology and the environment calls into question the starting point of the analysis presented here. Apparently the culture of our society is not dystopian after all, nor is our rationality purely formal; substantive considerations intrude with significant consequences. How are we to understand this complication in the picture with which we began? Two possibilities present themselves.

We can simply dismiss the Marxian-Weberian premise of social differentiation and formalization, and with it the related notion of an emancipatory dereification of rationality and the society dependent on it. This approach conforms to the skepticism with regard to traditional social critique expressed by postmodernists and some scholars in science and technology studies. They regard nostalgia for meaning as a dispensable illusion. But their attempts to reconstruct such essential aspects of social life as ethics and political resistance are unconvincing. These anti-critics usually end up with abstract appeals for tolerance of the other under a variety of fancy labels. One can hardly oppose this benign conclusion but it has little relevance to the politics of technology.

Alternatively, we could add to the notions of differentiation and formalization a complementary dedifferentiating and substantive dimension overlooked by most of the earlier social critics. In this case, the stripping down of complex social forms and meanings to functional residues would co-exist with other social processes tending in the opposite direction, toward a reconstruction of complex meaning systems. This is the position of Habermas, for example. He is sensitive to the dystopian threat of modernity but neither resigns himself to the triumph of a purely instrumental social logic nor projects an apocalyptic transcendence of dystopia. Habermas sees a conflict of opposing tendencies in modern societies, a tendency toward total systematization countered more or less effectively by another tendency promising a recovery of meaning. In Lukács a similar conflict is developed as an immanent dialectic between reified institutions and the lives they fail completely to contain. Although I do not think these positions are entirely successful, this general approach opens up the question of modernity in a new and fruitful way. I believe that something along these lines is in fact a correct description of the social process today.

A hermeneutics of technology is needed to articulate the dimension of meaning of technology and to explain how it relates to functionality. Many approaches to developing this hermeneutic are possible. For example, one could turn to the social histories of various

technologies for insight into how they engaged with many aspects of the life of their time. A theoretical approach to the relation of function and meaning might be elaborated through analysis of such examples. My very brief sketch of email clients shows the relation of function to meaning from this angle. What appear to be narrowly functional aspects of an interface in reality open up considerations on time that point to an unsuspected complexity. The apparently banal division of panes organizes more than incoming texts; it organizes the users' life, or a more or less significant part of it. In this concluding section of my paper I will sketch an approach that might guide research into such phenomena.

I am struck by the similarity between my own project and Heidegger's two apparently opposite interpretations of technical action in his early and late periods. The early account is explicitly phenomenological. It abstracts from causality to explain functionality in its relation to worldhood. The latter account is also interpretive although Heidegger no longer makes reference to phenomenology. This account, however, also abstracts from the usual causal interpretation of functionality in order to explain it ontologically. I believe that there is a hidden complementarity uniting these two accounts, but Heidegger presents them independently without reference to each other. Making the hidden connection between them explicit provides a basis for a theory of the double aspects of technology which Heidegger himself missed.

The first part of *Being and Time* lays out a remarkable phenomenology of action. Heidegger traces the links from an original attitude of care through the ordered relations of the various instrumentalities, materials and signs implicated in action. This analysis of "readiness-to-hand" shows that functionality is a complex aspect of networks of persons and objects, a "totality of involvements," and not a property of things taken by themselves. The analysis concludes with the notion that the whole matrix of action constitutes "significance," *Bedeutsamkeit*. The argument thus holds that function and meaning are inseparable aspects of what Heidegger calls "world," an ordered system of internal relations between *Dasein* and the objects of action. This notion of world lies behind the reflections of Simpson and Borgmann discussed above.

Heidegger's account is unclear. He does not explain precisely how meaning emerges in action. Is it a condition of action or a result? The "totality of involvements" is a system of relations between entities caught up in a technical network. Each particular functional relation is defined by an operative meaning of some sort that enables coping. Heidegger carefully defines the form of that narrowly functional meaning which is discovered in circumspection (*Umsicht*). The introduction of the concept of significance at the end of this analysis seems intended to tie the variety of these interconnected practices and meanings together in a wider space of action, a "world."

But is it in fact the case that the specific meanings involved in functional activities are connected in a coherent whole? The point of the social theories with which we began is the differentiation of function and meaning in modern societies. This interpretation of Heidegger's early theory resembles pragmatism in attempting to redefine as one what modernity has divided in practice. In this context a mere definition cannot justify the conceptual leap from function to meaning.

We need to ask why Heidegger felt it necessary to present his analysis of function as essentially related to meaning. Awareness of Heidegger's complicated relation to modernity helps to understand this conundrum. The radical social differentiation occurring around him ran increasingly counter to his understanding of life. As railroads, electrical systems and radio broadcasting constructed a functionally organized mass society, Heidegger reverted to the meaning-granting dimension of action to defend a human world. This world was impoverished to be sure, but it was at least a world, and not a mere causal concatenation in which human beings were caught up.

Lucian Goldmann explored one possible explanation for this approach. According to Goldmann, Heidegger's account of readiness-to-hand is an ontological version of the theory of reification in Lukács. Without adopting Goldmann's hypothesis of actual influence, it is still noteworthy that many categories of Heidegger's theory of worldhood have obvious affinities with contemporary cultural critique. Heidegger's argument, like that of Lukács, recognizes and also places a limit on the dystopian tendency of modernity beyond which the very notion of the human would cease to make sense. The inauthenticity of the mass appears to degrade human beings to the level of things, but contained in germ within inauthentic existence is a connection to meaning. This provides the basis for the possibility of authentic action, transcending any given stereotypical response to experience. Thus in his social context, Heidegger's analysis of action has an implicit critical aspect.

What is the evidence that such problems lay behind Heidegger's early theory? The lecture course entitled *Fundamental Concepts of Metaphysics* contrasts human action with other types of engagement with reality. Heidegger explains that the participation of *Dasein* in a world presupposes what he calls the "as" relation, that is, the ability to relate freely to meanings. Without such a relation to meanings, there is no world in his sense but only reflexive responses to particular stimuli. Heidegger needs the concepts of meaning and world to explain care and the projective capacity of the human being. It is this capacity which brings time to being. Animals and machines do not have it and Heidegger therefore distinguishes *Dasein* from these other types of being.

But did Heidegger relate the limitations of animals and machines to the status of *Dasein* in the emerging mass society? He did not descend to the level of social criticism to make such a point, but he came close in his later work. There "technology" is action planned on the basis of representations. Such action does not follow the logic of readiness-to-hand explained in *Being and Time*. Instead it is oriented by a concept of causality and an associated concept of predictability. A truncated functionalization obliterates meaning and its associated world in a mechanically organized and planned order. Human beings become resources and system components in such an order. When *Dasein* as the site of revealing is obscured by the enframing, meaning is impoverished or blocked altogether. If we reconsider the later Heidegger's analysis of technology in the light of his early work it is clear that what he calls the "danger" threatens *Dasein* with reduction to something very much like an animal or a machine. And this reduction threatens world as well as *Dasein*. How could it not given the unity of being-in-the-world which is defining for *Dasein*?

The contrast between these two modes of action—individual action and enframing—evokes the double aspects of technology, and with it, of the society it structures. Enframing describes an order that privileges power, that is, causal relations, functions, over meanings. In fact meanings become instruments of power in this society, little more than advertising slogans. The recovery of meaning in the full sense of the term through authentic action in relation to artifacts is evoked obscurely in the later works, for example in the essays on the thing and on building and dwelling. But Heidegger seems to be in full flight from modern technology in these interesting essays. If we go back to *Being and Time* for a more analytic concept of authenticity, we are steered away from technical practice toward a heroic conception of historical resistance. This conception has so little concrete content that it justified Nazism for Heidegger and communism for his student Marcuse.

Let us try a different tack. In *Being and Time*, the notion of authentic action involves "precisely the disclosive projection of what is factically possible at the time".<sup>15</sup> Heidegger

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<sup>15</sup> Martin Heidegger, *Being and Time*, trans. J. Macquarrie and E. Robinson (New York: Harper & Row, 1962), 345.

interprets this proposition in terms of the concepts of death and a vague notion of historical destiny. But we can apply it to *Dasein* in its technical dealings with entities. Then authenticity suggests technical creativity rather than revolution. Indeed, the free improvisations and resistances of individuals within the enframed system obey the logic of action described in *Being and Time*. These actions generate a meaningful world in the face of the “consummate meaninglessness” imposed by enframing. The dialectic of enframing and action describes the modern experience in all its threat and ambiguity.

I have attempted to work out the implications of this approach in terms of a theory of technology as both functional and meaningful. As functional technology responds to a causal logic and is explained in technical disciplines that are relatively differentiated and autonomous. As meaningful, technology belongs to a way of life and embraces not only a minimal significance directly related to its function but also a wide range of connotations that associate it with other aspects of the human world in which it is involved. The evolution of modern technology takes place in part through the interaction between these dimensions. Modern societies tend to separate them institutionally, for example, distinguishing engineering from everyday understanding, management from working life, and control from communication. But in practice there is constant interchange between the differentiated dimensions. In fact they interact and conflict not only institutionally but within the individuals as they respond in routine or innovative ways to the technological environment in which they live.

Consider once again the examples of communication on computer networks. The hacking of the Minitel network responded to users' perception of unexplored potentialities of the technology. These potentialities were suggested by the connection of the Minitel to the telephone network. The hackers must have been puzzled by the obstacles to communication on a familiar network dedicated precisely to that purpose. In introducing a new communicative functionality, they repositioned the computer in the structure of everyday life. Its meaning was transformed through the addition of this function. Notions of efficiency are not helpful in understanding this phenomenon. Nor is it useful to start out from the purely technical possibilities, quasi-infinite in principle. Rather, to imagine this innovation and to understand it, one must work in from meaning in all its complexity to its displacement in narrow functional terms. The key to this hermeneutic approach is thus a notion of substitution or abstraction that responds to specific technical potentials.

Examples such as this suggest a different notion of democracy from the usual one. We are not dealing here with rights and elections but with the negotiation of the technical framework of everyday life. From this standpoint the notion of liberation must be reformulated to signify a reversal in the relations of dominance between the two dimensions and the modes of action that belong to them. So long as the encounter with the technical in everyday experience is subordinated overwhelmingly to enframing, a one-dimensional universe prevails. But a social world in which the meaning-generating activities of the individuals freely interact with technical disciplines and artifacts would have a radically different character. Such a world would realize Marcuse's hope that the imagination might inform technology with values but it would not do so by creating a new form of scientific-technical rationality. Rather, it would invest disciplines and artifacts with the results of the experiential encounter with technology, that is, with new meanings emerging from human action.