

# MARCUSE

## CRITICAL THEORY & THE PROMISE OF UTOPIA

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13. Marcuse, *Das Ende der Utopie*, p. 61.
14. Herbert Marcuse, *Die Gesellschaftslehre des sowjetischen Marxismus*, (Neuwied and Berlin, 1964), p. 87ff.; *One-Dimensional Man*, p.
15. *Das Ende der Utopie*, p. 67.
16. *Ibid.*, p. 56.
17. *One-Dimensional Man*, p. 45ff.
18. Cf. for instance H. H. Holz, "Der Irrtum der 'Grossen Weigerung,'" in *Blätter für deutsche und internationale Politik* 1, (1968); P. Sedgwick, "Natural Science and Human Theory," in *The Socialist Register* 1966 (London, 1966), pp. 163-192; H. Wessel, "Die kritische Theorie bleibt negativ," in *Forum*, nos. 2-5 (1968).
19. Cf. H. Freyer, *Theorie des gegenwartigen Zeitalters*.
20. Cf. H. Freyer, *Über das Dominantwerden technischer Kategorien in der Lebenswelt der industriellen Gesellschaft*; A. Gehlen, *Die Seele im technischen Zeitalter*; and H. Schelsky, *Der Mensch in der wissenschaftlichen Zivilisation*.
21. H. Schelsky, *Der Mensch in der wissenschaftlichen Zivilisation*, pp. **21-22**.
22. Cf. A- Gehlen, "Über kulturelle Kristallisation," in *Studien zur Anthropologie und Soziologie*.
23. Cf. *Ibid.*
24. *Das Ende der Utopie*, p. 11ff.
25. *Ibid.*, p. 14.
26. Cf. for this P. Sedgwick, "Natural Science and Human Theory," p. 169; "One's principal objection to Marcuse cannot then rest on his pessimism, but on his thoroughgoing mechanism: his hope and despair are equally based on some assumption of a constant, predeterminate technological threshold that can in itself function either to exclude or to impel the action of the class."



## CHAPTER TWELVE

# The Bias Of Technology

Andrew Feenberg

### Neutrality and Bias: An Ambiguous Critique

Herbert Marcuse's *One-Dimensional Man* appeared in 1964, at a time when both Marxism and liberalism were unanimous in their praise for the new technological society coming into being. The appearance of Marcuse's sharp critique of technology was a surprise. It is now easy enough to attach Marcuse's ideas to a tradition of Marxist technology criticism, but at the time that current ran underground and was invisible to all but a few aficionados of 20th century intellectual history. Such soon- to-become classics as Lukacs' *History and Class Consciousness* and Adorno and Horkheimer's *Dialectic of Enlightenment* were untranslated and out of print, scarcely mentioned in the few works that noticed their existence at all

The immediate impact of Marcuse's book was atmospheric rather than academic. It contributed to a rapidly growing climate of resistance to the technocratic dystopia feared by the newly emerging cultural and political opposition of the 1960s. Marcuse's name became a symbol of these oppositional currents and, in response, his ideas were attacked as anti-technological and anti-scientific. This was the real scandal of *One-Dimensional Man*, which outraged readers on the right and the left even more by its critique of progress than by its social and political radicalism.

In this chapter, I propose to re-examine Marcuse's critique of technology from a distance, so to speak, outside the context of its time and





the debates it sparked, strictly in terms of its theoretical contribution. I will show that Marcuse's critique of technology, while radical indeed, does not imply an irrationalist hostility to science and reason as is often supposed. The demonstration will require not only a break with the accepted image of Marcuse, but also with the peculiar rhetorical strategy of his later works. His style is itself a conscious provocation, a refusal of the accepted canons of academic discourse. The effectiveness of this strategy can be measured by Marcuse's remarkable impact. However, there is a cost: the constant compression of ideas into dramatic-formulations emphasizes the dialectical connections, but often obscures the meaning of the concepts so connected.

Here is a passage from *One-Dimensional Man* which can serve as an example of the difficulties of Marcuse's style, while introducing the main themes of the discussion to follow.

Technology serves to institute new, more effective, and more pleasant forms of social control and social cohesion . . . . In the face of the totalitarian features of this society, the traditional notion of the "neutrality" of technology can no longer be maintained. Technology as such cannot be isolated from the use to which it is put; the technological society is a system of domination which operates already in the concept and construction of techniques . . . . As a technological universe, advanced industrial society is a *political* universe, the latest stage in the realization of a specific historical *project* - namely, the experience, transformation, and organization of nature as the mere stuff of domination. As the project unfolds, it shapes the entire universe of discourse and action, intellectual and material culture. In the medium of technology, culture, politics, and the economy merge into an omnipresent system which swallows up or repulses all alternatives. The productivity and growth potential of this system stabilize the society and contain technical progress within the framework of domination, Technological rationality has become political rationality.<sup>1</sup>

Marcuse's basic claim is that there is an essential connection between modern technology and the domination of man by man in the existing industrial societies. He asserts this claim by employing two familiar concepts - domination and technology - in a strange and unfamiliar combination: technology *is* domination and vice versa. By "technology" Marcuse means just what we would expect: machines, industry. His concept of domination refers to the suppression of the individual by society, both in the external form of exploitative hierarchy and coercive power, and the internal or "introjected" form of conformism and authoritarianism. (Despite the claims of his critics, Marcuse never extended his critique of domination to a rejection of all authority in society and moral conscience in the individual.) Thus Marcuse's argument holds that today the machine is not merely *used* for the purpose of suppressing individuality but that it is the basis for new types of suppression it alone

makes possible and which it is in some sense destined to carry out.

Marcuse's dialectical style works on the ambiguities of certain terms in a way which is both illuminating and confusing. When he writes, for example, that science is "political" or that technology is "ideological," he makes the strong point that science and technology cannot be understood outside their connection with the historical universe in which they function. Yet in making his point in this way, Marcuse blurs the essential difference between science and technology, on the one hand, and politics and ideology, on the other. He might be taken to mean that, as ideology, science and technology are nothing more than the rationalization of the interests of a particular class. But then opposition to that class would include opposition to "its" science and technology. This view is undoubtedly irrationalist, and bears a certain ominous resemblance to romantic critiques of technology which call for a return to religious values or a simpler, pre-technological way of life.

Yet this is not at all Marcuse's intent. Despite his sharp criticism of "technological rationality/" he still maintains the old Marxist faith in the ultimate liberating potential of technology. Technology still represents for Marcuse the hypothetical possibility of overcoming scarcity and the conflict to which it gives rise, but capitalism "represses" this technical potential for emancipation by casting society in the form of an ever renewed struggle for existence.

To avoid an irrationalist misrepresentation of his position, Marcuse is obliged to offer correctives to his strong critical claims, asserting the neutrality, validity and instrumental effectiveness of science and technology despite their "ideological" character. Thus he asserts with equal assurance that "technology has become the great vehicle of *reification*," and that "science and technology are the great vehicles of I/ liberation."<sup>2</sup> He writes:

If the completion of the technological project involves a break with the prevailing technological rationality, the break in turn depends on the continued existence of the technical base itself. For it is this base which has rendered possible the satisfaction of needs and the reduction of toil - it remains the very base of all forms of human freedom. The qualitative change lies in the reconstruction of this base - that is, in its development with a view of different ends . . . .

The new ends, as technical ends, would then operate in the project and construction of the machinery, and not only in its utilization.<sup>3</sup>

The mutually cancelling formulae do actually add up to a theory, but one that is buried in the interplay of the inadequate concepts used to present it. The meaning of Marcuse's theory is clouded by the lack of explicit ' distinctions; he insists, rather, on making distinctions implicit in the use ■ ' and context of his concepts. But his rhetorical strategy is clear enough: from a variant of the Marxist position he extracts results that one would ; expect from the irrationalist critique. He wants to both have tus ■; conceptual cake and eat it too, making the strongest possible critique of technology without paying the "luddist" price.

The conceptual chaos that results from this procedure has confused Marcuse's critics and even the most sympathetic have drawn back from his more radical formulations. Their reluctance gains authority from Marcuse's own attempts to rectify his aim by waffling occasionally on his strongest claims. Thus, at one point he states that a computer or a cyclotron can equally serve capitalism and socialism, apparently oblivious to the fact that, if this is taken as a general example, it seems to invalidate his own argument that "technology as such cannot be isolated from the use to which it is put." Habermas, among others, has taken this concession to mean that Marcuse really believed in the political neutrality of technology all along.<sup>4</sup> Another critic, Joachim Bergmann, has pointed out that without a distinction between the purely neutral technical resources of advanced societies and their actual realization in particular ideologically biased technologies, there can be no critique of "repressed potential" such as Marcuse wishes to elaborate.<sup>5</sup> How indeed would one measure this potential if it were not with respect to purely technical powers, abstracted from specific social embodiments in particular technologies and therefore also from whatever political or ideological function these technologies may serve?

Worse yet, in his considerations on the new emancipatory technology, Marcuse seems to waver back and forth between the utopian idea of a technology that liberates nature in responding to human aesthetic needs, and the "realistic" affirmation that basic needs will continue to be served by the very "technological rationality" he condemns so sharply for its connection to domination.<sup>6</sup> But the core of Marcuse's argument holds that in a liberated society technology as a whole would contribute to freedom precisely through serving basic needs in a new way. This would mean a new direction for progress, not the addition of a thin veneer of "humanized" technology on the surface of a world engineered in all its essential features to the destruction of man and nature.

It is puzzling that Marcuse did not arrive at a *clearer* formulation of his theory in response to his critics. It seems unlikely that terminological failings and rhetorical temptations suffice as an explanation for his problems. I will argue that many of the difficulties in Marcuse's position stem from the fact that it has two independent but converging sources. The first of these sources is the classical Marxist theory of the alienation of "free labor" in capitalist society. This strand of the theory leads directly to the promise of a disalienated industrial society in a socialist future, a future for which, Marcuse readily admits, there is still no precedent.

However, there is another strand to Marcuse's argument which holds that technical reason is a priori adapted to the maintenance of social domination, not just under capitalism and in response to the class interests of capital, but essentially, *in itself*. This position seems closer in spirit to critics of technology such as Martin Heidegger or Jacques Ellul who are frequently described as romantics. It is this "romantic" or better still "ontological" strand of the theory which leads to Marcuse's rejection of "the traditional notion of the 'neutrality' of technology," and his belief that technical reason cannot be adapted to the requirements of a free society without fundamental transformation.

Rather than resolving the tension between these two sources of his views, Marcuse seems to have used each as a corrective for the excesses of the other. Where Marxism tends toward technological optimism, Marcuse drew on his more radical critique of technical reason to sharpen the issues. Where that radical critique tends to slide into a metaphysical despair, Marcuse drew back from the comfort of the abyss with a Marxian emphasis on the concrete social causes of distress and misery.

I am not convinced that Marcuse reconciled these positions successfully, but his attempt is extremely interesting and invites us to further reflection on the issues he raised. Can we, through the further elaboration of Marcuse's own concepts, bring these two approaches to the critique of technology together? This is the difficult question of the internal consistency of a radical critique of technology such as Marcuse's. I will address it in the remainder of this chapter.

### The Neutrality of Technology

Perhaps the best way to gain a deeper insight into Marcuse's position is to focus on his assertion that "the traditional notion of the 'neutrality' of technology can no longer be maintained." Here is a claim that runs through his whole critique of technology. Yet in reality, Marcuse's rejection of the neutrality thesis is by no means so categorical as it seems. What is the traditional notion of the neutrality of technology, and with what new conception does Marcuse propose to replace it?

The neutrality of technology consists first of all in its indifference, as pure instrumentality, to the variety of ends it can be made to serve. In this sense of the term, the neutrality of technology is merely a special case of the neutrality of instrumental means, which, in themselves, stand essentially under the norm of efficiency but are only contingently related to the substantive values they may be made to serve in concrete applications. This conception of neutrality is familiar and self-evident.

There is a second sense in which technology is said to be "neutral." Not only is technology claimed to be indifferent with respect to ends, but it also appears to be indifferent with respect to culture, at least among the modern nations, and especially with respect to the political distinction between capitalist and socialist society. A hammer is a hammer, a steam turbine is a steam turbine, and such tools are useful in any social context, assuming the existence of a suitable technical infrastructure to support their employment. In this respect, technology appears to be quite different from legal or religious institutions, which cannot be readily transferred to new social contexts because they are so deeply embedded in the institutional structure of the society of their origin. The transfer of technology, on the contrary, seems to be inhibited only by its cost.

The sociopolitical neutrality of technology is usually attributed to its "rational" character and is related to the universality of the truth embodied in the technology, a truth which can be formulated in verifiable causal propositions. Insofar as such propositions are true, they are not socially and politically relative but, like scientific ideas, maintain their cognitive status in every conceivable social context. Hence, what works in

one society can be expected to work equally well in another.

The rational universality of technology also makes it possible to apply the same standards of measurement to technologies employed in different settings. Thus the progress of technology is routinely said to increase the productivity of labor and social wealth in comparisons not only between different countries but also between different eras and different types of societies.

In opposition to these widely accepted views of the neutrality of technology, Marcuse asserts that technology is fundamentally biased toward domination. His alternative position can be formulated as follow- in three "theses," each of which summarizes an aspect of his argument.

1. Technology as a means is not politically innocent because, even as it serves generic ends such as increasing the productivity of labor, its specific design and application in the existing industrial societies forms the basis for a way of life that involves the domination of man by man. In this sense, the means (technology) are not truly "value free" but can be said to include within their very structure the end of preserving the status quo.

2. Technology as a total system, a cultural formation, takes the place traditionally occupied by ideology in legitimating the existing society, it thereby forecloses opposition to the wrongs of the society, obstructs progress in its humanization, and sustains the continuity of domination inherited from the past history of class society.

3. Scientific-technical rationality is a priori adapted to the maintenance of social domination.

These theses contradict the conventional view of the neutrality of technology described above. Marcuse insists on linking means and ends, denies that technology is indifferent with respect to the alternative of capitalism or socialism, and challenges the apparent value-freedom of technological rationality. And yet, as we have seen, Marcuse's insistence on the possibility of a transition to socialism based on the "reconstruction" of existing technology implies some sort of notion of the neutrality of technology, albeit a different one from the "traditional notion" he rejects.

But what kind of neutrality would be compatible with Marcuse's claim that technology in advanced industrial societies is designed to serve the end of domination? What peculiar kind of neutrality can describe scientific-technical reason if it is a priori biased toward domination? Is thi-. not a contradiction in terms? Or is it possible that neutrality and bias can coexist together?

I will argue that neutrality and bias can and do in fact coexist and that Marcuse's theory rests on the possibility of their coexistence. It raa'j be helpful here at the outset to make the reasons for this position dear. J wilt attempt to do so at first in terms that are not internal to Marcuse's highly speculative discussion of the same topic in his critique of formal rationality. I hope that by beginning in this way I will be able to make the general line of Marcuse's approach more plausible by clearly distinguishing between the type of bias that Marcuse attributes to formally neutral systems such as science and technology and the more familiar type o t cnas that characterizes ideologies, prejudices and discriminatory arrangement', of all sorts.

### **Substantive and Formal Bias**

Marcuse's position on technology implies that bias is not the opposite of neutrality, and that bias in fact cuts across the distinction between ideological and neutral elements of social systems. To my knowledge, the first recorded statement of this position is in Plato's *Gorgias* where Callicles rejects the laws on the grounds that their neutrality, which takes the form of equal treatment of the strong and weak, responds to special interests of the weak. He argues,

I can quite imagine that the manufacturers of laws and conventions are the weak, the majority, in fact. It is for themselves and their own advantage that they make their laws and distribute their praises and their censures. It is to frighten men who are stronger and able to enforce superiority that they keep declaring . . . that injustice consists in seeking to get the better of one's neighbor. They are quite content, I suppose, to be on equal terms with others since they are themselves inferior.<sup>7</sup>

It is curious that Marcuse's attempt to revive the critique of neutrality should follow Callicles in attributing bias to law - although in this case it is not legislation but science that is in question - and yet arrive at the opposite conclusion so far as the beneficiary of the bias is concerned, connecting scientific law to the interest in domination of the strong. This reversal is undoubtedly related to changes in the concept and function of reason in advanced societies as compared with classical antiquity.

Callicles' critique of law shows clearly that there are not one but two quite different types of bias that we normally distinguish in criticizing unfair actions and institutions. In the first place, there is the bias that results from applying different standards to individuals where they ought properly to be judged by the same standard. Racist discrimination is in this category. Second, there is a more subtle form of bias which consists in applying the same standard to individuals but under conditions that favor some unfairly at the expense of others.

This second form of bias is present in a great many different contexts, and it is often difficult to identify. It characterizes conditions in which "formal" equality contradicts biased social "content," such as where equality before the law is systematically frustrated by the unequal ability to pay for legal representation, or where equal educational opportunity is denied not by discriminatory exclusions but by teaching a class or ethnically biased cultural heritage that is difficult for the unfavored groups to learn. This type of bias is also present wherever procedures based on equal treatment for all are introduced or suspended according to instrumental considerations at times or places favoring the interests of one group at the expense of others. This is the case, for example, in certain countries where military leaders respect the results of elections only when the candidates of which they approve win office. For reasons that should become clear in a later section of this chapter, I will borrow a distinction

from Max Weber's theory of rationality, and call the first type "substantive" bias and the second "formal" bias.

The epistemological implications of these two types of bias are very different, representing two different types of methodological error. Substantive bias, based on the application of unequal standards, is most often associated with prejudice, with explicit norms that discriminate between people of different classes, races, sexes or nationalities. However, since it is difficult to justify unfair treatment on the basis of mere personal preferences, such norms are generally represented as factual judgments arbitrarily attributing abilities or merits, disabilities or demerits to the more or less favored groups. The epistemological critique of such bias proceeds by showing up these pseudo-factual judgments as "rationalizations," or, where they are highly elaborated, as "ideologies."

Formal bias implies no necessary feeling of prejudice, nor is it associated with factual errors based on rationalization of feelings. On the contrary, the facts, honestly reported, generally support claims of fairness aimed at justifying this type of bias, so long as their selection carefully excludes embarrassing contextual considerations. Outside the larger context, fair treatment seems to be rendered through an equal application of the same standards to all. But in that context, it becomes clear that the apparent fairness of the system, taken in isolation, hides the systematic unfairness of the results of its application.

Criticism of formal bias therefore requires redefining the relevant domain of considerations that need to be taken into account in judging the action or institution in question. It is not the particular factual claims advanced in favor of the discriminatory activity that are challenged, but the horizon under which those facts are defined as the totality of relevant considerations. The enlargement of the cognitive horizon in such cases involves passing from arbitrarily isolated elements to a larger system which embraces them all and grants them their functional significance. Thus to show discrimination in the case of a culturally biased test, it is **necessary** to demonstrate that the discriminatory outcome is functionally related to the goals of the dominant social groups.

Criticism of this type is compatible with various epistemological stances, among which is the Hegelian-Marxist approach of Marcuse. This form of critique implies an epistemology based on essential relations in a functionally structured whole. Its proponents sometimes refer to the Hegelian distinction of "abstract" and "concrete" to explain their approach. For Hegel, the "abstract" is not the conceptually universal but the part isolated from the whole to which it properly belongs. "Concrete" is the network of relations binding the parts to the whole.

In Marxist terminology, a methodology is "reified" if it insists on working with such "abstract" elements, refusing systematically to enlarge its horizons of explanation to the dimensions of the "concrete" wholes through which the parts take on their meaning and significance. A society is likewise "reified" if its structure systematically obscures the inner connections between its various sectors and institutions, protecting them from critical scrutiny by the uninformed observer. On these terms.



advanced industrial societies exhibit a typical reification through which the formal bias of their institutions is occluded. "One-Dimensional" thought is complicit in this bias in so far as it refuses the critical-theoretic gesture of enlarging the contexts of explanation to encompass the concrete whole.

### Technique and Technology

A considerable advance in understanding Marcuse's position on technology can be made from the standpoint of the distinction between substantive and formal bias. Typically, critics of technology like Marcuse find themselves accused of irrationalism because they are believed to be attributing what I have called substantive bias to technology. This would amount to saying that technology, like religious beliefs or social customs, has validity only in so far as it is part of the shared myths of the society to which it belongs. The scientific-technical principles underlying technologies would have to be treated on the same terms as magical rituals or political doctrines. The logical order of the scientific-technical disciplines would be as empty of intrinsic meaning as the rules of chess or bridge. This position is clearly incompatible with the Marxist one, to which Marcuse subscribes, according to which the science and technology developed under capitalism form the basis for an advance to socialism, subject to the necessary "reconstruction," to be sure.

In fact, Marcuse attributes formal rather than substantive bias to science and technology. If it is difficult to see this implication of Marcuse's theory, part of the reason lies in his lack of a clear terminology in which to express the moment of truth in the idea of the neutrality of technical reason.

The distinction required by Marcuse's theory can be made by abstracting the level of application of objective knowledge of nature embodied in technologies from their concrete social realization. As a matter of convenience, it makes sense to reserve the term "technique" for specific technical elements, such as the lever or the electric circuit, which are in themselves neutral with respect to concrete social ends. These elements are like the vocabulary of a language; they can be strung together to form a variety of "sentences" with different meanings and intentions. "Technologies," defined as developed ensembles of technical elements, are greater than the sum of their parts. They meet social criteria of purpose in the very selection and arrangement of the intrinsically neutral elements from which they are built. These social purposes can be understood as "embodied" in the technology and not simply as an extrinsic use to which a neutral tool might be put. Thus the study of any specific technology ought to be able to trace the impress of a mesh of social determinations which preconstruct in some sense a whole domain of social activity aimed at quite definite social goals.

On the basis of this distinction, it is possible to construct an approach. With the critical results Marcuse seeks to achieve, that is, to show that social values penetrate technologies despite the fact that technologies embody an objective knowledge of nature with a quite different

epistemological status from such socially relative phenomena as customs, political institutions or religious beliefs. In the case of technologies, values can be shown to operate in the choice of technical elements and the resulting "fit" of the formally rational technological subsystems and society at large. The bias originates not in the formal system itself but in its concrete realization in a real world of times, places, historical inheritances, in sum, a world of concrete contingencies.

This explains why "reconstruction" of technology is a possible and necessary feature of the transition to socialism. The social environment of the transitional society is in flux and the old "fit," which favored certain groups at the expense of others, no longer works. A new way must be found of organizing the formally neutral materials from which technologies are built up, appropriate to the new society growing up around them.

The traditional notion of the neutrality of technology discussed earlier represents the reified approach to formal neutrality. It succeeds in demonstrating the value-freedom of technology precisely to the extent that it abstracts from all contextual considerations. Marcuse's method consists in recovering these lost contexts through which finally it is possible to develop a historically concrete understanding of technology. But it is also important to note that in this as in other instances of formal bias, the decontextualized elements from which the biased system is built up *are* in fact neutral in their abstract form. The illusion of technological neutrality arises from the attempt to understand socially concrete technologies on the model of the abstract technical principles they embody in a unique and value-laden combination.

The first two theses on technology which I have attributed to Marcuse flow directly from these considerations. They reflect the social consequences of the systemic involvement of technologies in a society based on class rule. These theses summarize the Marxian "moment" in Marcuse's critique of technology. They will be treated in the next section of this chapter. The third thesis has a different status. It attributes intrinsic bias to the formally neutral materials, the very scientific-technical rationality, from which technologies are built up. This is the other strand in the Marcusean critique, the "ontological" moment. This strand of the argument aims to uncover what might be called the ontological preconditions for the possibility of formal bias. Why, in fact, are formally biased systems so commonplace in modern societies? Can it be an accident that formally neutral concepts and procedures lend themselves so readily to applications we consider misuses or abuse<sup>1</sup>? Marcuse's response will be treated in a third section of this chapter.

### *The Marxian Moment: Technology and Class Power*

Marcuse interprets Marx's theory of alienation as a critique of capitalist technology. Despite the widely held view that Marx was a latent technocrat, this interpretation of his position finds considerable support in early sections of *Capital* and the *Grundrisse*. In these texts, Marx attempts to understand how capitalism has fused the drive to increase

economic productivity, and the equally important drive to maintain capitalist power on the workplace.

To the extent that workers are divorced from the means of production, the control of their labor falls to the capitalist owners of enterprise, who must devise technological and managerial solutions to the problems of labor discipline. Thus Marx writes that

the control exercised by the capitalist is not only a special function due to the nature of the social labour-process, and peculiar to that process, but it is, at the same time, a function of the exploitation of a social labour-process, and is consequently rooted in the unavoidable antagonism between the exploiter and the living and labouring raw material he exploits.<sup>8</sup>

Technological choices, *like all* other aspects of production, are determined by the *fact that* the pursuit of efficiency involves the imposition of effective control, not only over nature, but also over human beings at work. Technological progress is subtly influenced by this requirement. It proceeds under the aegis of two goals, a purely technical and a socially specific goal, one serving generic human interests and the other serving class interests.

These considerations explain how the very same Marx who foresaw the liberation of humanity in a technologically advanced socialist society could also be the author of sharply critical diatribes against the division of labor and the use of machinery under capitalism. He wrote of science, for example, that it "is the most powerful weapon for repressing strikes, those periodical revolts of the working class against the autocracy of capital."<sup>9</sup> And in another passage, Marx claims that "it would be possible to write quite a history of inventions, made since 1830, for the sole purpose of supplying capital with weapons against the revolts of the working class."<sup>10</sup>

Arguing in part on this basis, Marcuse writes that "the machine is *not neutral*; technical reason is the social reason ruling a given society and can be changed in its very structure."<sup>11</sup> What is new in Marcuse's formulation is the passage from a critique of *technology* to a critique of *technical reason*. This is certainly not in Marx, although it is possible, as Lukacs demonstrated, to develop such a critique out of Marx's theory of economic fetishism and his attempts at explaining the way in which capitalist economic science masks exploitative relations in the economy. In his essay on Max Weber and in *One-Dimensional Man*, Marcuse attempts to derive his critique of technical reason directly from the Marxian theory of the dual criteria of progress under capitalism. A consistent interpretation of one major strand of Marcuse's argument can be drawn from this source. This interpretation holds that technical reason has been distorted by the same forces that have distorted technological development. I will present such an interpretation very briefly below. ...

In his essay on Weber, Marcuse shows how Weber's explanation of the general concept of formal economic rationality implicitly presupposes "the separation of the workers from the means of production ... (as) a *technical*

necessity requiring the individual and private direction and control of the means of production — The highly *material*, historical fact of the private- capitalist enterprise thus becomes ... a *formal* structural element of capitalism and of *rational* economic activity itself."<sup>13</sup> Thus the terms in which Weber comprehends the social world introject the given forms of domination as a priori bases of conceptualization. Marcuse considers Weber's analysis to be significant in revealing by its example the generally ideological character of formal social concepts under capitalism. The definitions of social objects, the criteria of means/ends rationality, concepts of efficiency, progress and so on all exhibit this a priori bias toward domination.

This explains why capitalist technical concepts are operational in themselves and do not require constant reference to an explicit sociological analysis to be employed. The concept of "efficiency," for example, implicitly includes domination of the labor force without reference to the problems of capitalist labor discipline because such domination is already implied in the very notion of means/ends rationality in this society. What Marcuse calls the "technological rationality" of this society is indelibly marked by the presupposition that domination is the necessary condition for effective control. The trace of this presupposition can be found in economic thought, managerial methods and the design criteria of technology itself.

*One-Dimensional Man* takes this argument still further by showing the ideological function of such capitalist-distorted forms of technical rationality in advanced society. Marcuse argues that today technological rationality is no longer simply biased in its operational employment, but has become a legitimating mechanism for the perpetuation of domination. This thesis carries us well beyond the Marxian position. In Marx's theory, capitalism is still subject to criticism on the grounds of technical inefficiency. Since alienation has become an obstacle to the growth and development of the productive forces, the normative goal of creating a more humane society is in conformity with the purely technical goal of increasing economic productivity. The critique of capitalism can thus proceed simultaneously on technical and normative grounds.

Marcuse believes this original Marxian position has been invalidated by the progress of contemporary capitalism. Technical considerations no longer demonstrate the inadequacy of the capitalist organization of production. Technological rationality can no longer serve, as it still did for Marx, as the basis of a critique of the prevailing relations of production, but becomes, in fact, the legitimating discourse of the society. Habermas summarizes this aspect of Marcuse's theory.

At the stage of their scientific-technical development, then, the forces of production appear to enter a new constellation with the relations of production. Now they no longer function as the basis of a critique of prevailing legitimations in the interest of political ... enlightenment, but become instead the basis of legitimation. *This* is what Marcuse conceives of as world-historically new.<sup>13</sup>

Under these conditions, technological rationality tends more and more to support the system as the (apparently) only efficient way of operating a technological society. The problem is no longer the inability of capitalism to make effective use of the technologies it has developed, but rather the catastrophic human consequences of the effective use of these very technologies.

Not only is technical progress distorted by the requirements of capitalist control, but the "universe of discourse," public and eventually even private speech and thought, limit themselves to the posing and resolving of technical problems within the double constraints of the simultaneous interest in technical advance and domination that characterizes capitalist rationality. "When technics becomes the universal form of material production, it circumscribes an entire culture; it projects a historical totality - a 'world.'"<sup>14</sup> The universalization of technical modes of thought changes the cultural conditions presupposed by the Marxian theory of emancipatory struggle. There is no place for critical consciousness in this world: it is "one-dimensional." The normative critique is thus forced to appear explicitly and independently; it can no longer hide behind the Marxian demand for a liberation of the productive forces to full development.

This explains why Marcuse, unlike Marx, not only attacks the dominant social interests that preside over technological choices, but also criticizes technical modes of thought and criteria of progress. His critique is directed at "technological rationality," a self-propelling system of domination through technology, increasingly out of control of its human masters. He writes that "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 spheres of culture."<sup>15</sup>

### Socialism and Reason

How deep is the challenge to rationality posed by this "Marxian moment" in Marcuse's theory? As summarized above, the theory in fact has no irrationalist implications. Yet it is often difficult to isolate this strand in Marcuse's argument from the other far more radical ontological critique of technology, and the terminological shortcomings of Marcuse's argument exaggerate the difficulty unnecessarily.

The significance of this strand of Marcuse's argument becomes clearer when it is viewed in its political context. Despite the political discouragement implied by his conclusion, Marcuse's theory quickly inspired widespread critical discussion in advanced societies. Some of this criticism was irrationalist in the proper sense of the term - Marcuse was himself criticized as "soft" on technology by Roszak and others he influenced. But Marcuse's influence flowed also into other intellectual currents that pressed for a critical rationalism, independent of political power and its so-called "experts," and able to assess the social world historically and philosophically in opposition to the dominant overemphasis on quantitative methods and social engineering. The

outcome of this tendency included such characteristic and essentially positive phenomena of the 1960s as a growing rejection of the technocratic pretensions of both capitalist and communist elites, movements for self-criticism among professionals, and the interest in "appropriate technology," and environmental reform.

All these developments have in common an implicit reference to a level of technical rationality purified of exploitative features by a historically informed critique. The doctor critical of current medical practice or the teacher involved in the radicalization of his or her discipline does not generally aim to destroy the technical underpinnings of his or her own work, but to identify the ways in which bourgeois society has penetrated and distorted these underpinnings. A new "paradigm" is required, not an alternative to reason. Marcuse's theory opens the way to just such a critical search for new paradigms by identifying the point at which technical reason becomes historical, that is to say, *class* reason through introjecting the specific requirements of capitalist control at its basis.

From this standpoint, we are returned to something very much like Marx's own views on the transition to socialism, insofar as they can be inferred from his scattered remarks on the subject. Marx rejected utopian thinking in favor of the idea of a dynamic process of social change which would start out with the capitalist inheritance and gradually transform it under the conditions of a new class power. While Marx did not apply this schema explicitly to technology, it can be inferred from his harsh critique of the capitalist factory that he envisaged radical changes in its design and employment under socialism, long before the transition to the highly automated system projected in some of his more speculative writings. The reshaping of inherited technology can be understood as a process of bootstrapping. The technology would not be thrown out, nor would it simply be put to new uses in a different social context, but rather it would be employed to produce new technological means, fully adapted to the requirements of a socialist society.

It is important to distinguish clearly between this developmental approach, and the notion that the technology developed under capitalism is neutral with respect to social systems, that the same means can be used for different ends. Marx's position suggests the further relationship: not what different *ends* may be directly served by a given technology, but what new technological *means* it may produce, in a technically and culturally feasible sequence leading from one type of industrial society, oriented toward certain definite values, to a quite different type of society oriented toward other values. Marcuse makes this alternative clear in writing that, "what is at stake is the redefinition of values in *technical terms*, as elements in the technological process. The new ends, as technical ends, would then operate in the project and in the construction of the machinery, and not only in its utilization."<sup>16</sup>

The Marxian moment in Marcuse's critique of technical rationality reaches its extreme limit at this point. The historically institutionalized forms of technical reason, whether they be technologies or professional specializations or social sciences, fall before a critique which reveals their inhumanity in revealing their limitations *qua* technical reason. Rut

reason itself emerges unscathed, in fact purified by the fixe of criticism, its ultimate neutrality confirmed by the critical glance that strips it bare of sociological accretions. This is the paradox of the Marxian moment, that it can only achieve a historically concrete critique of reason's bias toward domination by gesturing toward an abstract ideal of truly neutral technical reason, undistorted by power and ideology.

Is this enough? Can criticism stop short at this point, essentially the point where Marx stopped, without risking a collapse into renewed positivity, naive rationalism, perhaps even technocracy? This is truly the parting of the ways. A version of critical theory can be elaborated starting out from the Marxian moment in Marcuse's critique of rationality. Such a version of critical theory has the immense advantage, in terms of gaining wide acceptance and producing conviction, of requiring no metaphysical concepts, and can be elaborated against a background of common assumptions about the nature of reality. But Marcuse did not accept this position. He insisted stubbornly and to the last on pushing the critique far beyond this point, attacking the metaphysical roots of the problems, braving the scorn of empiricist and neo-Kantian alike by proposing a speculative theory of reason more deeply critical than the one sketched above, more surely protected against affirmative regressions.

Here is where the second strand in Marcuse's critique of technology comes in. This "ontological" critique is based on the refusal to separate technology and technical reason per se from the social and cultural framework within which they operate. The technical reason on the basis of which modern technology has been developed may in itself be "neutral" in some sense, but it is an abstraction insofar as it is considered outside the entire context of involvements in which it emerged as theory and to which it returns as practice. Technical reason is not just an epistemological category but also a civilizational one. The complex formed by modern society and technology is no more neutral than medieval cathedrals or Egyptian pyramids, but embodies the specific values of a particular civilization, Western civilization, the civilization of "Reason." The task of the philosopher, from this standpoint, is to articulate and judge these values embodied in technology and in the course of doing so to uncover the bias of reason itself.

### The Ontological Moment: The Radical Critique of Technology

The preceding discussion has shown that Marcuse's theory of technological bias implies the neutrality of technique. We are now ready to consider his demonstration of the complementary point that the neutrality of technique implies in its turn a kind of bias. This is Marcuse's most controversial thesis on technology, according to which there is an intrinsic a priori connection between scientific-technical rationality and domination. According to this thesis, "science, by virtue of its own method and concepts, has projected and promoted a universe in which the domination of nature has remained linked to the domination of man."<sup>17</sup>

This proposition is in some sense shocking, and the consensus of

Marcuse's critics has been entirely negative as far as it is concerned. Such generally sympathetic critics as Habermas and William Leiss dismiss it as a vestige of romantic nature philosophy.<sup>18</sup> Not only is this position extremely unpopular, it is far more difficult to understand than the themes treated above. It stems from a different tradition, less widely known and followed in the United States than even the Marxism which inspires Marcuse's other ideas on technology. This tradition begins with Hegel's critique of the "understanding," and, more specifically, of scientific quantification and lawfulness. It continues in Nietzsche's genealogy of the "will to truth," and his attempt to demonstrate the power drive behind rationality. Finally, Marcuse himself is strongly influenced by the development of these themes in the work of contemporaries, primarily, Husserl, Heidegger, Lukacs, Adorno and Horkheimer.

With the possible exception of Hegel, all these thinkers reject the representation of scientific objectivity as detached and disinterested knowledge. They are all engaged in demystifying what Nietzsche calls the "last idol," the ideal of "truth" conceived as the absolute vision of a subject which, as knower, situates itself beyond the world. It is important to note that the emphasis of this critique is not on human fallibility, and the critique is not necessarily associated with scepticism. Rather, it is the traditional conception of truth itself which is in question because that conception is based on the theological assumption that truth is the sort of knowledge achieved by a disembodied, decontextualized and "perfect" subject.

According to this traditional theological notion of truth, finite subjects are not "perfect" in this same way, and can therefore achieve knowledge only by abstracting themselves from their facticity as embodied, sensuous, feeling beings. To Nietzsche and his successors it is quite arbitrary to propose a purely ideal and imaginary perfection as a standard and to measure real subjects by it. To rid the concept of truth of this theological assumption, it *must* be subjected to one or another type of radical reconstruction in accord with the ontological requirements of a conception of the universe in which even the hypothesis of an infinite subject of knowledge is dismissed as meaningless.

These requirements include the necessary involvement of the (finite) subject of knowledge in the world which it knows. But this is equivalent to saying that the subject of knowledge must be conceived first and foremost as an acting being, therefore as a being engaged with reality for essentially interested reasons. From this point of view, the customary pretensions to objectivity and detachment associated with scientific- technical knowledge appears as an ideology covering undisclosed existential involvements.

The interests masked by scientific objectivity have been variously interpreted. At the very least, the "philosophers of finitude" under discussion here see destiny at work in the relation of modern science to technology. They invariably reject the commonplace view that 'Ciencce "works" because "knowledge is power," that scientific theories are susceptible to technological application for the simple reason that they are true. Clearly, some kinds of knowledge yield power over nature, but this



must be due to an a priori orientation toward power characteristic of the most basic methods and concepts associated with those ways of knowing. Thus it is not knowledge which is power but rather power which is a form of knowledge. On these terms, formal classification under laws, cause-effect reasoning, and especially quantification have been identified as epistemological expressions of the interest in instrumental control underlying the pursuit of scientific knowledge.

This is one aspect of Marcuse's position, argued at great length with the aid of citations from Husserl, Heidegger, Adorno, and Horkheimer. However, from Marcuse's standpoint merely pointing out the internal link between science and instrumental control is insufficiently critical. This view does not really threaten the customary idea of scientific objectivity, nor does it *essentially* connect science and technology to the progress of domination.

Habermas has shown, for example, that the theory of science as instrumental reason can be worked out to its logical conclusion in complete abstraction from all political content. It proves possible to relate science to a general interest in instrumental control without actually toppling the "idol" of objectivity because, as Kant already demonstrated long ago, the generically human can be treated "as if it were true for all practical purposes. Indeed, if science represents generically human interests, it is "detached" and "neutral" with respect to all particular interests, that is to say, all really historically existing interests such as we know them. What more can one ask in the way of disinterestedness?

Marcuse goes far beyond this initial step toward a demonstration that the instrumentalist character of science binds it essentially to the practice of domination. Now this is quite a different proposition. On these terms science is truly "political," as Marcuse argues, and its pretension to occupying a neutral post above the struggles of history is shattered. But these considerations seem to imply a fundamental inconsistency between Marcuse's various critiques of technology. For, if reason is *essentially* tied to domination, then it is difficult to see how any amount of "reconstruction" of its technological products can transform them into suitable "vehicles of liberation."

Two puzzling features of Marcuse's theory are aimed at overcoming this apparent inconsistency, and reconciling the ontological and the Marxian moments of his critique. The first of these consists in the *historical* treatment of reason as an *ontological* category. Marcuse's critique of rationality is unusual in that he rejects the idea of an ahistorical category "reason," essentially burdened by transhistorical values such as the will to power. But if the nature of reason changes in history, then so, in a sense, does its object, being. For Marcuse, such basic categories as essence and existence, fact and value have a historical meaning and are not fixed once and for all by an ontology that would transcend and underlie history.

On these terms, reason (and its technological products) can be analyzed in its contemporary form as the product of forces that lie at the crossroads of ontology and history. In support of this position, Marcuse follows the lead of Horkheimer and Adorno in relating the historically specific forms of technology and reason to the emergence of class society. The technical

reason of modern capitalist societies is thus doubly determined by class power, once in the specific forms criticized in the previous section, and a second time in the vaster context of the overriding history of class society as a whole. The critique corresponding to this larger form of class determination is aimed not at distortions introduced into a fundamentally neutral technical reason, but rather at identifying the intrinsic bias in technical reason itself insofar as it emerges from the conditions and requirements of class society in general. This way of developing the critique holds open the possibility of historical change in the ontologically essential determinations of technology and reason in a classless society of the future.

This historical treatment of reason is connected to another still more paradoxical feature of Marcuse's theory. Where the irrationalist critique of reason attempts to undermine the claims of science to neutrality and objectivity by showing them to be an ideological veil for hidden interests, Marcuse argues that it is the very neutrality and objectivity of science that supplies the link between its instrumental and its repressive dimensions. He writes, for example, that "it is precisely its neutral character which relates objectivity to a specific historical Subject - namely, to the consciousness that prevails in the society by which and for which this neutrality is established."<sup>19</sup>

As we have seen, the Marxian moment in Marcuse's critique leads to recognition of the neutrality of a hypothetical technical reason purified of class distortions. The ontological moment in Marcuse's critique is designed to foreclose any possibility of uncritical acceptance of this idealized model of a purified technical reason. Technical reason is indeed neutral at some level, Marcuse will argue, but its very neutrality subserves it to domination and so ties it to the history of class society. In what follows I will attempt to explain the articulation of these two critiques in more detail.

### **The Problem of Rationality**

The best place to begin this discussion is with the attempts of Marx, Weber and Lukacs to explain the function of rationality in capitalist society. Marx demonstrated that the power of the capitalist class is reproduced through the formally equivalent exchange of wages for labor power. This demonstration opened the way to the study of the formal bias of apparently neutral social subsystems, and raised one of the fundamental questions that gave rise to the science of sociology - the question of the social significance of rationality. As a chapter in the history of attempts to answer this question, Marcuse's theory is unusual in drawing on the philosophical critique of science and technology discussed above.

Weber plays a pivotal role in the evolution leading from Marx to Marcuse. His theory of rationalization continued and enlarged Marx's approach to formal neutrality. For the purpose of this theory, Weber introduced the terms "substantive" and "formal" rationality, adapted above to the discussion of the forms of bias, to describe two different, types of social thought and action,<sup>20</sup> Rationality is "substantive" to: the

extent that it responds to norms embodying a higher purpose such as feeding a population, winning a war or maintaining the social hierarchy. The "formal" rationality of capitalism primarily characterizes those economic arrangements which optimize calculability and control and which aim directly at efficiency in production and distribution rather than at the fulfillment of "substantive" needs. Formally rational systems lie under technical norms that have to do with efficiency in the organization of means rather than the achievement of specific ends.

In Weber, the term "rationalization" refers to the generalization of formal rationality in capitalist society, often at the expense of traditional substantively rational modes of action, with paradoxical consequences for the distribution of social power. While the application of Weber's concept of substantive rationality is unclear and subject to controversy, it seems reasonable to consider precapitalist societies as substantively rational to the extent that reason enters into their organization at all. These societies exhibit a specific type of rationality that supports the power of the dominant social groups. Nowhere does one find any claim to cognitive neutrality in the forms of rationality that maintain such systems. On the contrary, their bias is explicit and rests on a hierarchy of functions presumed to be consecrated by God. Thus in these cases there is perfect consistency between the forms of rationality, penetrated as they are by substantive ends, and the discriminatory social outcomes.

This is not the case in capitalism, where the neutral forms of rationality support discriminatory outcomes despite (or because of!) their neutrality. Weber is quite aware that the outcome of rationalization *is* favorable to the ambitions and claims of certain social groups, capitalists and the bureaucracy, which tend to rise to the top of any rationalized society. Yet the formally rational systems of accounting, control, production and exchange which produce this effect are in themselves value-free. The inconsistency between this neutrality of the means and the discriminatory outcomes characterizes capitalist society as a whole.

Like Marx's theory, Weber's leads to the recognition of the discrimination resulting from the normal operation of formally rational systems such as markets, administrations, the law, and professionalization. And like Marx's theory, Weber's is subversive of melioristic attempts to soften the hard edges of a formally rationalized society. Attempts to overcome the bias introduced by formal rationalization generally proceed through new types of substantively rational systems, such as affirmative action quotas, compensatory educational programs, or provisions for aid to the poor in the exercise of their rights. But such substantively rational systems are subject to criticism on grounds of formal irrationality. These were, in fact, the terms on which Marx himself criticized proposals for redistribution of wealth under capitalism. The current crisis of the welfare state seems to confirm that if socialism is conceived merely as a substantively rational corrective to formal rationality, the result will be the dismal one foreseen by Weber - generalized inefficiency leading to the imposition of new types of control from above.

The first, and to my knowledge still the major, attempt to achieve a really penetrating theoretical explanation for the bias of rationality under capitalism is contained in Lukacs' early Marxist work, *History and Class Consciousness*. Lukacs introduced the term "reification" to describe the processes Weber had

summed up under the category of "rationalization." The difference in emphasis this change in terminology connotes is significant, for Weber still tends to see the impact of rationalization on social power as externally related to rationalization itself, whereas Lukacs conceptualizes these contextual considerations as internal to the process of reification. Lukacs brings to light the congruence of modes of thought and action that rest on the fragmentation of society, formalistic thinking, and the autonomization of production units under the control of private owners.<sup>21</sup>

This approach opens the way to a theory of socialism as more and other than a mere corrective to the injustices of capitalism. However Lukacs himself failed to pursue the discussion to its logical conclusion and did not develop such a theory. Nor did he criticize scientific-technical thought per se, but rather he confined his attack to the social sciences and the institutions of capitalism. Thus while Lukacs' theory does explain why formal rationalization supports the specific inequalities that characterize capitalism, this theory does not explain the curious "accident" that formal rationality of the scientific-technical type became available at a certain point in history as the cultural form of a system of class domination. Marcuse goes beyond Lukacs in this regard, and attempts to account for the growing political role of science and technology in advanced capitalism in terms of the essential bias of scientific-technical rationality. He aims at nothing less than a general theory of the link between formalism and class domination throughout history, and on that basis he tries to sketch the main outlines of a new society, including the forms of its scientific and technical practice.

### **The Critique of Formal Neutrality**

Like Lukacs before him, Marcuse considers the universality of bias in the rationalization process to be a *problem* and not simply an accident of world-historical scope. He writes:

Scientific-technical rationality and manipulation are welded together into new forms of social control. Can one rest content with the assumption that this unscientific outcome is the result of a specific societal *application* of science? I think that the general direction in which it came to be applied was inherent in pure science even where no practical purposes were intended, and that the point can be identified where theoretical Reason turns into social practice.<sup>22</sup>

We can rephrase the problem he poses by asking, What the significance is of the general availability of formal systems for applications that are biased to favor domination? Is there something about their very neutrality which opens them to such applications? What happened "originally" in the initial construction of the formal mode of abstraction that rendered it

pliable in this particular way?

To follow Marcuse's argument to this point is difficult because we do not normally think of formally neutral systems as essentially implicated in their applications. Rather, the involvement of formal systems in strategies of domination appears to proceed from the subject' who makes a repressive use of these systems just as he might pick up a rock and use it as a weapon. It would be comical to suggest that the rock is "biased" a priori toward such uses, that its hardness is the essential precondition by which it lends itself to violence. Marcuse's very question reverses our normal assumption that biased applications are a "distortion" or "misapplication" of formally neutral systems. But Marcuse is seeking precisely to connect formal neutrality and domination as moments in a dialectical totality. This is perhaps admissible to the extent that, unlike rocks, formal systems are human inventions created in a specific social context.

Marcuse's treatment of this problem depends on his dialectical ontology which, in turn, is based on the distinction between "substantive" and "logico-mathematical" or "formal" universal. He attempts to show why formal universals are available for repressive application, and then takes the argument one step further, to demonstrate that this availability is not accidental but proceeds from the very essence of this mode of abstraction. The outcome of this demonstration is a general theory of the possibility of the phenomena I describe with the term "formal bias," understood not as a contingent aspect of formal systems, but as an intrinsic dimension of those systems themselves.

The construction of substantive universals involves a kind of idealization, a reduction of contingency which makes possible the conceptualization of the "essence" of what actually exists. In the case of social universals such as freedom or justice, this essence does not refer directly to its given instantiations, but rather expresses their historical potentialities, beyond the confining facts of life in any existing society. For Marcuse, these potentialities are not merely ideal but are immanent to the things themselves, where they appear as internal contradictions in reality. Thus substantive universals transcend the split between "ought" and "is," and as such provide the basis of a critical consciousness which, in the course of history, learns to struggle for its realization through social action,

Marcuse's theory of substantive universals is rooted in a unique form of conceptual realism. Particulars are not independently real for Marcuse, but their essential connections to other things are perceptible only through concepts. These concepts,

are identical with and yet different from the real objects of immediate experience. "Identical" in as much as the concept denotes the same thing; "different" in as much as the concept is the result of a reflection which has understood the thing in the context (and in the light) of other things which did not appear in the „ immediate experience and which "explain" the thing (mediation)...

By the same token, all cognitive concepts have a transitive meaning;

they go beyond descriptive reference to particular facts. And if the facts are those of society, the cognitive concepts also go beyond any particular context of facts - into processes and conditions on which the respective society rests, and which enter into all particular facts, making, sustaining, and destroying the society. By virtue of their reference to this historical totality, cognitive concepts transcend all operational context, but their transcendence is empirical because it renders the facts recognizable as that which they really are,<sup>23</sup>

According to Marcuse, the dialectical concept of potentiality reflects consciousness of a demand for freedom which is present implicitly in philosophy from the very beginning. To be sure, throughout most of history, the overwhelming realities of scarcity and domination block and distort philosophical thought. As a result, the potentialities it identifies appear as an unhistorical, metaphysical dimension beyond the given. Philosophy suffers the same fate as the imagination and artistic creation. In all these domains the demand for a better reality is blunted through marginalization of the dangerous visions in which the truth attempts to shine forth. Simultaneously, the merely given reality appears to be completely disconnected from its metaphysical or artistic truth, and therefore subject to another, purely formal kind of abstraction. In Hegelian terms, the given is delivered over to "immediate facticity." Formal thinking originates in the split between essence and existence which results from the conditions of life in class society.

Formal thinking is a specific negation of dialectics, its active suppression in favor of another ontology. This type of thinking starts out from the a priori acceptance of what is and abstracts from the given not toward its potentialities but rather toward its form. Formal abstraction systematically evacuates the "content" of its objects, classifying or quantifying them in terms of the function they can be made to serve in a system of instrumental controls. Thus instead of transcending the given toward its essential potentialities, which this type of universality cannot conceptualize in any case once it has abstracted from all concrete contents and the dialectical contradictions they contain, formalism exposes its objects to manipulation, transforms them into means.

The essence of formal thinking is the refusal of precisely that mode of conceptual and practical mediation in which the potentialities of being are revealed. Mediation appears as mere fantasy, the potentialities of the given as objects of derealized evaluation or imagination. The suppression of dialectical mediation is reflected in the sharp split formal thinking sets up between reason and imagination, fact and value, reality and art. Now the "content" dialectics had identified as pointing toward suppressed potentialities is redefined as mere "value," subjective and arbitrary, with no ontological roots at all. Being is strictly defined as the object of instrumental manipulations. In recent times, formalistic positivism finally does away with even the metaphysically marginalized expressions of the tension in reality between what is and what might be.

Here is the core of Marcuse's argument. Formal universal are "value-free" in the sense that they do not prescribe the ends of the objects they

construct conceptually as means. However, they are value-laden in another deeper sense. The very conception of value from which formal universals are "free" is itself a product of the abstractive process in which formalism suppresses the dialectical concept of potentiality. Thus formalism is not in fact "neutral" with respect to the alternative of actual and potential in its objects. Rather, it is clearly biased toward the actual, what is already fully realized and present to hand.

Methodologically, this bias appears in the refusal (or rather, the inability) to integrate history and social contexts as the scene of development. Formal abstraction restricts its range to the artificially isolated, individual, given object as it immediately appears. It accepts this given being as truth and in so doing comes under the horizon of the existing society and its modes of practice. Thus the horizon of the manipulations it opens is the uncritically accepted horizon of domination under which its objects lie. These objects can be used, but not transformed, adapted to the dominant social purposes, but not transcended toward the realization of higher potentialities in the context of a possible, better society.

This is the reason why formal bias is an intrinsic possibility of formal systems. Formal abstraction cuts the essential connections between objects and their contexts in terms of which dialectics uncover their potentialities. In so doing, it ignores an important dimension of the truth of reality, that which concerns the inner tensions in its objects that point toward possibilities of progressive development. Instead, the objects are conceptualized as fixed and frozen, unchanging in themselves but available for manipulation from without. It is this way of constructing its objects that comes back to haunt formal thinking in the biased application of its products. Formal bias arises as soon as the abstracted objects it constructs are reintegrated to a real world of historical contingencies. At that point, the essential relation between the abstraction and the residue of material content from which it was abstracted is revealed as a predestination to domination. Then it becomes clear that "formalization and functionalization are, *prior* to all application, the 'pure form' of a concrete societal practice."<sup>24</sup>

The hypothetical system of forms and functions becomes dependent on another system - a pre-established universe of ends, in which and *for* which it develops. What appeared extraneous, foreign to the theoretical project, shows forth as part of its very structure (method and concepts); pure objectivity reveals itself as object *for* a *subjectivity* which provides the Telos, the ends. In the construction of the technological reality, there is no such thing as a purely rational scientific order; the process of technological rationality is a political process,<sup>25</sup>

So long as formal abstractions co-exist with the "second dimension" of substantive universals, culture is divided to reflect the real contradictions of class society. It is possible, on the terms of such a divided culture, to formulate transcending potentialities of the society. Under these

conditions, social criticism can become mass consciousness and lead to revolutionary change in the interest of realizing the emancipatory potential of the given level of technical civilization. Marxism was elaborated under just such conditions.

However, in advanced industrial societies, Marcuse argues, the second dimension is increasingly replaced by concepts drawn from the apparatus of technological rationality. As every aspect of social life comes to be articulated exclusively through technical concepts, "transcending" thought and action becomes correspondingly more difficult to conceive. The identification of social crises and injustices no longer points toward the need for fundamental social change, but instead indicates technical problems that must be resolved under the norm of efficiency. The modes of action and organization of the given society, which presuppose domination, operate as invariant, a priori concepts in the "solutions" offered, and so technological rationality takes on a distinctly conservative political cast.

The link between this form of instrumentalism and domination becomes apparent in the paradox of advanced societies, increasingly effective in controlling not only nature but also man himself. Every advance in the power of formalistic thought and action is an advance in the suppression of men. Minimally, this suppression takes the form of repressing the potentialities for peace and freedom made possible by technical progress itself. At its extreme point of absurdity, pure formalism may someday become material in the destruction of the earth through the untrammelled exercise of technical power in nuclear war.

### **Science, Technology, and Socialism: Science and Liberation**

On what condition can the advance of human intelligence and control of nature issue not in the instrumentalization and domination of man but in human liberation? In answering this question, Marcuse's thought becomes frankly speculative and utopian. He argues that reason can only serve humane purposes through the recovery of a dialectical conception of reality, in which being is recognized as fraught with potentialities for liberation. This he believes to be possible on the basis of the Marxist historical reformulation of the concept of being and the immense technical power of advanced societies. The split between metaphysical and technical goals is no longer rational, but can finally be overcome. Marcuse foresees the day when his third thesis would be rendered historically obsolete by the emergence of a new science and technology.

The exploration of these themes is really the subject of another essay on Marcuse's theory of liberation. However, the discussion of Marcuse's critique of technology would not be complete without an examination of some of its positive implications. This examination will show that Marcuse's approach is rich in speculative anticipations of the new society, but also marred by tensions and problems that result, I believe, from the lack of a conceptual framework such as one introduced above for the analysis of the forms of bias and the relation of technique and technology. It is in fact here in Marcuse's theory of liberation that the limitations of his



rhetorical strategy, based on playing off his two critiques of technology against each other, finally pose serious problems for the coherence of his position.

The worst of these problems arise in his speculations on the new science. Marcuse's critique of formal rationality helps to understand the role of scientific-technical knowledge in the elaboration of formally biased systems of all sorts, including technology. However, it is unclear from Marcuse's discussion how this can be changed. Did Marcuse wish to suggest the abolition of formal thinking in a free society? If not, in what would this new science consist?

Marcuse has far more trouble offering a plausible answer to this question than to similar ones concerning technology. There is a good reason for this. The socialist reconstruction of social systems and institutions, technologies and forms of organization can proceed through the recombination of formally neutral elements. But what raw material is available for the reconstruction of those elements themselves? How can the process of formal abstraction be transformed as Marcuse proposes without being negated as such? And yet Marcuse explicitly rejects the regression to a "qualitative physics."<sup>26</sup>

Instead he argues for the necessity of science "becoming political," incorporating human values into its very structure. And he claims that "in constituting themselves *methodically* as political enterprise, science and technology would *pass beyond* the stage at which they were, because of their neutrality, *subjected* to politics and against their intent functioning as political instrumentalities."<sup>27</sup> For example, he suggests that science would overcome the split between value and fact, essence and existence, in "quantifying" values, and he proposes that the ability of science to calculate such things as necessary food supplies shows this to be possible.<sup>28</sup> The significance of this example escapes me, for such quantification might serve besiegers starving out a city just as well as humanitarians fending off world hunger. Still more confusing is the suggestion that a new science could determine values for a socialist society, for surely Marcuse would have rejected the technocratic implications of such a proposal.<sup>29</sup> I do not believe this to be a plausible path toward a solution, at least not in Marcuse's very rough and programmatic formulations. In the domain of science, affirmative action in favor of values simply will not work.

These suggestions are characterized by the failure to distinguish between countering formal bias at the basic a priori level where it is present in pure scientific and technical knowledge, and countering such bias at the level of concrete social realizations such as technologies or institutions. Marcuse's suggestions for a radical reform of science and technique are modeled directly on effective strategies for dealing with formal bias as it appears in those latter realizations. He appears to believe that the way to remove the a priori bias of formal abstraction per se is to change the abstractive process to reincorporate the material content the exclusion of which is defining for it. Perhaps for lack of a terminology in which to state this problem, Marcuse seems unaware of it and never proposes an argument for the analogy he insists on making.

Marcuse's failure to clarify these issues adequately has consequences

that are politically dangerous, for it suggests an analogy between the very active role of political power in institutional and technological change and its role in scientific change. We have seen that according to Marcuse's ontological critique of scientific-technical reason the neutral technical elements used in the reconstruction of society are themselves biased a priori toward domination, and it is this intrinsic bias which forms the background to their effective combination in technologies that serve to perpetuate the specific forms of domination prevailing in each historical epoch. Socialism would thus be working in some sense against the grain of its materials so long as a new cognitive dispensation had not occurred. Does this mean that political intervention into the development of scientific-technical rationality is necessary, by analogy with the role of politics in technological change? It would be possible to conclude as much from the structure of Marcuse's theory. And yet nowhere does he suggest that the necessary transformation of scientific-technical rationality is a political task. Rather, it is a scientific-technical task with political implications. The distinction is critical.

This clarification of Marcuse's position should help to distinguish it from the quite different position of the "Proletcult" group to which it bears an embarrassing resemblance. Shortly after the Russian Revolution, the Proletcult argued that all culture is intrinsically ideological - substantively biased in my terms - including such supposedly neutral elements as language, technology and science. The revolution would not be complete until a new "proletarian" culture had been created and substituted for the reactionary inheritance of the past.<sup>30</sup>

The assimilation of science to the superstructures as an ideological expression of bourgeois society seemed to resolve an inconsistency in the traditional Marxist treatment of the problem. Following Engels, most Marxists attributed the genesis of modern science to the uniquely favorable conditions of early bourgeois society, while insisting that this specific historical background in no way diminished the universality of the achievements of modern science. Proletcult treated science as Marxism had always treated law, art and other superstructures, eliminating the embarrassing residue of transhistorical scientific truth from the system.

Although both Lenin and Stalin opposed this view in theory, Lysenko was able to introduce political criteria into the actual institutional structure of Russian science. The catastrophic failure of this experiment in "proletarian" science continues to inspire a widespread and justified fear that the failure to distinguish between science and ideology threatens freedom of thought.

Marcuse was, of course, aware of this history, and his discussion of science in *One-Dimensional Man* is marked by an implicit worry that he will be misread as supporting political controls over science, if not its outright abolition. Yet without an explicit concept of formal bias, he has trouble differentiating his position from that of the Proletcult. Still, his intent to do so is clear enough. The most telling evidence for this is his refusal to attack the truth claims of modern science. He writes, for example, that "contemporary science is of immensely greater objective validity than its predecessors." And he argues that under socialism,

scientific "hypotheses, without losing their rational character, would develop in an essentially different experimental context (that of a pacified world); consequently, science would arrive at essentially different concepts of nature and establish essentially different facts."<sup>31</sup> Thus not political power but scientists' own changing categories and perceptions in a radically new social environment would eventually inspire new types of questions and new theories, generated spontaneously in the course of research by scientists themselves. Presumably a similar change would occur at the level of pure technical knowledge.

The claim that such an evolution could ultimately eliminate the formal bias of scientific-technical rationality is probably not decidable in advance of the actual discoveries that would accomplish this immense revolution in the nature of reason. Philosophical study can at best hope to hold open the possibility that scientific development may proceed toward a new methodology embracing the contradictory character of reality. With respect to this possibility, Marcuse's speculations on the new science may be seen as imaginative symbols, but not as concrete proposals. The task of elaborating such proposals remains to be accomplished. It may be that new developments in science are already available to facilitate that task. There have been a number of attempts to argue this, for example by Prigogine and his collaborators. However, to examine their claims would take us far afield.

### Toward a New Technology

Marcuse's ideas on the new technology are no less speculative than his ideas on science. However, they are far more interesting and suggestive. Under socialism, he argues, instrumental action would no longer be autonomized under the horizon of the given stage in the history of domination, but would come to incorporate elements of imagination, value and artistic consciousness working toward a higher stage of historical freedom. Formal thinking and modern technology would be reconciled with the suppressed dialectical mode of thought and the historical practice of realizing potentialities it guides. This reconciliation would mark the end of the history of class society and its associated subject. It would involve the emergence of a new subject with differently ordered faculties and correspondingly new forms of practice, unlike those of societies based on the domination of man by man.

It is evident that Marcuse's argument had to lead to a sort of eschatology of Reason. If it is class society that gives rise to the split in the concept of reason that divides the dialectical understanding of essence from the formalistic achievement of control, then the end of class society will see the end of this split. The theory leads rigorously to the conclusion that the derealized dimensions of metaphysics, art and the imagination, in which essence has been confined, must now be rejoined with real life through a completely new kind of scientific and technical practice. The two worlds must become one through a final reconciliation of essence and existence, real and ideal.

Technique would then tend to become art and art would tend to form reality: the opposition between imagination and reason, higher and lower faculties, poetic and scientific thought, would be invalidated. Emergence of a new Reality Principle: under which a new sensibility and a desublimated scientific intelligence would combine in the creation of an *aesthetic ethos*?<sup>2</sup>

What would be the content of this new form of technical practice? Obviously, it would have to continue to provide the food, shelter, medical care, and other amenities of civilized life. These goods are not relative to a particular type of society but relate to universal requirements of human nature. But according to Marcuse there are other human needs that are equally vital but which have been suppressed under the conditions of scarcity and class domination prevailing in the existing technological societies. These needs are loosely defined as "aesthetic," relating to beauty: the harmony of freedom and order exemplified by great works of art, the transcendence of struggle and striving in images of peace and fulfillment.

Marcuse argues that these aesthetic needs are not merely subjective, a function of changing taste, or merely spiritual, confined to the "higher" sphere of contemplation and feeling. Rather, the realm of the aesthetic is rooted in the order of nature itself and expresses tendencies in nature which come to consciousness in and through man. Marcuse suggests the "outrageous" concept of a "liberation of nature" to describe these tendencies, not in the sense of a natural teleology, but rather in the sense "that there are forces in nature which have been distorted and suppressed - forces which could support and enhance the liberation of man."<sup>33</sup>

In a free society, the realization of these tendencies would operate not alongside or over and above ordinary technical practice, as in the marginalized world of artistic production today, but in the very practice of transforming nature to make it serve human needs.

It remains to consider whether a beginning could be made toward creating such a new form of technical practice by applying the existing scientific-technical rationality. Although Marcuse himself does not seem to be aware of it, this is in reality the question of the consistency of his two critiques of technology.

According to Marcuse, socialism is only possible on the basis of the transformation of the technology inherited from capitalism. If the technical base is conserved rather than transformed, a "fateful continuity" will link the new society with the old, and insure the reproduction of the forms of repression and alienation the revolution was supposed to overcome. However, it will be recalled that scientific-technical rationality develops according to its own internal motives, under the influence of the social environment to be sure, but not on a schedule set by political events such as revolutions and policy changes. Thus there is no reason to assume that the revolution will be accompanied by simultaneous changes in the nature of rationality. And this means that the revolution can only succeed if it is able to employ the existing scientific-technical rationality *transitionally* while awaiting a new cognitive dispensation it cannot force by

political means. How then would such transitional employment be distinguished from the sort of "fateful continuity" that would doom the revolution to failure?

Perhaps Marcuse does not pose this question because he fails to make explicit the different temporalities implied by his treatment of technology as subject to political control in contrast to science which is only loosely influenced by the environment. Unfortunately, the incompleteness of his theory on this point makes it appear either incoherent or unnecessarily utopian: Marcuse seems to call for a simultaneous and "total" revolution in so many spheres that no humanly possible social change could possibly satisfy him. His concept of the "great refusal" has been interpreted to support such a view although in fact it is the choice between lesser evils Marcuse rejects and not the achievement of positive but partial goods.

Although Marcuse does not solve this problem satisfactorily, his theory contains the means to construct a solution which avoids the excesses of both utopian technophobia and uncritical acceptance of given technology as a fate. Recall that the essential flaw in scientific-technical rationality, by which it is bound to biased application, lies in its reified decontextualization of the objects it constructs. Thus it should be possible to at least advance toward a new technology by multiplying the contexts and technical systems that interact in any given application to take into account more and more of the essential features of the object. The initial steps in this direction are obvious and concern the integration of ecological, medical, aesthetic, and work-democratic considerations into the existing technologies to begin the movement toward a better society. Thus just as technical practice now incorporates the requirements of domination in its basic structure, in a free society it would instead incorporate the requirements of peace and freedom.

### The Radical Critique of Bourgeois Culture

Marcuse's theory of socialism draws together the Marxist aim of a disalienation of industrial society, the modern avant garde's struggle for a radical desublimation of art, and the contemporary environmental critique of productivist industrialism. At the core of his positive theory is a reevaluation of the aesthetic, as the source of new needs and a new practice of freedom. He believes his theory of the aesthetic can be rooted in Marx's work, and he refers to Marx's *Economic and Philosophic Manuscripts* as the evidence for this surprising notion. He writes:

Aesthetics of liberation, beauty as a "form" of freedom: it looks as if Marx has shied away from this anthropomorphism idealistic conception. Or is this apparently idealistic notion rather the *enlargement of the materialistic base*? For "man is directly a *natural being*; he is a corporeal, living, real, sensuous, objective being" who has "real, sensuous objects" as the objects of his life \_\_\_\_\_. This is . . . the extension of Historical Materialism to a dimension which is to play a vital role in the liberation of man.<sup>34</sup>

The connection to Marx suggested by Marcuse is not entirely persuasive, and yet there is a larger context to Marcuse's projections which encompasses Marx as well. This context is the mood of revulsion at bourgeois culture that runs through the whole history of the European intelligentsia and artistic avant gardes from the mid nineteenth century until quite recently.

It is Marcuse's relationship to this traditional radical critique of bourgeois culture which determines his positive attitude toward the future despite his abandonment of orthodox Marxist determinism. Yet even this revised form of historical hope seems eccentric in the contemporary theoretical context. In recent years, non-communist left theory has paid more and more attention to the procedural defense of socialism in terms of its potential for enlarging democratic dialogue. This approach no doubt represents a reasonable reaction to charges of totalitarianism increasingly addressed to Marxism. Yet at the same time, one wonders if the procedural emphasis is not a function of the success of the system in "delivering the goods," as Marcuse would say. To provide a substantive theory today of the "content" of freedom poses especially difficult problems since it is not immediately obvious what needs require satisfaction beyond the horizon of the advanced societies.

As a Hegelian and a Marxist, Marcuse refused to address the formal question of freedom in isolation from the content or purpose for which men and women might struggle to achieve it. If this content could no longer be found in the necessities of life, then it had to be sought elsewhere - for example in the aesthetic - if socialist theory were ever to connect with real history again. Marcuse's response to this challenge is astonishingly radical and imaginative. It flows from his critique of technological rationality as a cultural system, a way of life, a general form of social practice and corresponding needs.

Marcuse's rejection of this culture must be understood on the analogy of the rejection of bourgeois society and its culture by earlier critics. Like them Marcuse attempts to project a different way of life from that of the existing societies, one which fulfills dimensions of the human personality that are systematically suppressed today. It is this extremely radical cultural break with the existing societies that thrusts Marcuse headlong into imaginative speculations drawn from the whole history of modern artistic and political critique.

It is strange that such a radical theory, based on such sources, should be so obviously out of tune with the mood of the left today, only a few years after Marcuse's death, and yet this is the case. If Marcuse already seems to come from another era, this may be due less to the implausibility of his speculative projections than to the increasing resignation of intellectuals in the West, less and less able to imagine a truly radical break with the present.

I want to take this opportunity to thank Gerald Doppelt for his criticism of an earlier draft of this chapter. Comments by Robert Pippin, Douglas Kellner, and Anne-Marie Feenberg were also useful to me in improving the chapter, and I thank them for their help.

## NOTES

1. Herbert Marcuse, *One-Dimensional Man* (Boston, 1964), pp. xv-xvi.
2. *One-Dimensional Man*, p. 168; Marcuse, *An Essay on Liberation* (Boston, 1969), p. 12.
3. *One-Dimensional Man* p. 231-32; cf. pp. 221-22.
4. Habermas, "Technology and Science as 'Ideology,'" in *Toward a Rational Society*, pp. 88-90.
5. Joachim Bergmann, "Technologische Rationalitat und spatkapitalistische Okonomie," in Jurgen Habermas, ed., *Antworten auf Herbert Marcuse*, pp. 99-100.
6. *One-Dimensional Man*, p. 251.
7. Plato, *Gorgias*, p. 51.
8. Karl Marx, *Capital* New York, 1906 reprint), vol. 1, p. 363.
9. *Ibid.*, vol. 1, p.
10. *Ibid.*, vol. 1, pp. 475-76.
11. Marcuse, "Industrialization and Capitalism in the Work of Max Weber," in *Negations* (Boston, 1968), p. 225.
12. *Ibid.*, p. 212. Cf. *One-Dimensional Man* p. 144-45.
13. Habermas, "Technology and Science as 'Ideology,'" p. 84.
14. *One-Dimensional Man*, p. 154,
15. *Ibid.*, p. 158-
16. *Ibid.*, p. 232. For more on this subject, see Andrew Feenberg, "Transition or Convergence: Communism and the Paradox of Development," in Frederick Fleron, ed., *Technology and Communist Culture*.
17. *One-Dimensional Man*, p. 166.
18. Habermas, "Technology and Science as 'Ideology,'" pp. 85-86; William Leiss, *The Domination of Nature*, pp. 211-12.
19. *One-Dimensional Man*, p. 156; cf. pp. 138, 147, 158, 168; and in Marcuse's essay on Max Weber in *Negations*, p. 215.
20. For a useful discussion of relevant issues in Weber, see, Donald McIntosh, "Max Weber as a Critical Theorist," *Theory and Society* (January 1983).
21. For more on this subject, see Andrew Feenberg, *Lukacs, Marx and the Sources of Critical Theory*, chapter 3.
22. *One-Dimensional Man*, p. 146.
23. *Ibid.*, pp. 105-106,
24. *Ibid.*, p. 157.
25. *Ibid.*, p. 168.
26. *Ibid.*, p. 166.
27. *Ibid.*, pp. 233-34.
28. *Ibid.*, p. 232.
29. *Ibid.*, p. 233,
30. For an interesting analysis of the cultural problems raised by this group, see Carmen Claudin-Urondo, *Lenin et la revolution culturelle*, pp. 47-60.
31. *One-Dimensional Man*, pp. 166-67.
32. Marcuse, *An Essay on Liberation*, p. 24. For a more detailed

account of these new forms of social practice, see Andrew Feenberg, *Lukacs, Marx and the Sources of Critical Theory*, chapter 8.

33. Marcuse, *Counterrevolution and Revolt* (Boston, 1972), p. 66.

34. *Ibid.*, pp. 67-68.

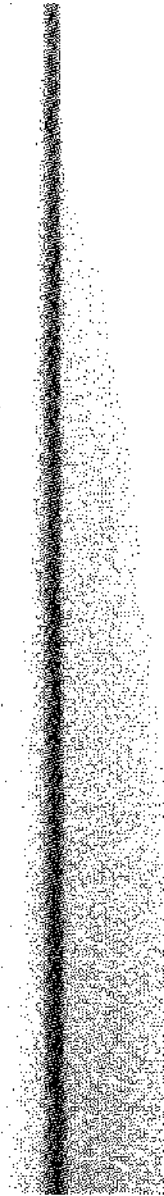




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# MARCUSE

## CRITICAL THEORY & THE PROMISE OF UTOPIA

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13. Marcuse, *Das Ende der Utopie*, p. 61.
14. Herbert Marcuse, *Die Gesellschaftslehre des sowjetischen Marxismus*, (Neuwied and Berlin, 1964), p. 87ff.; *One-Dimensional Man*, p.
15. *Das Ende der Utopie*, p. 67.
16. *Ibid.*, p. 56.
17. *One-Dimensional Man*, p. 45ff.
18. Cf. for instance H. H. Holz, "Der Irrtum der 'Grossen Weigerung,'" in *Blätter für deutsche und internationale Politik* 1, (1968); P. Sedgwick, "Natural Science and Human Theory," in *The Socialist Register* 1966 (London, 1966), pp. 163-192; H. Wessel, "Die kritische Theorie bleibt negativ," in *Forum*, nos. 2-5 (1968).
19. Cf. H. Freyer, *Theorie des gegenwertigen Zeitalters*.
20. Cf. H. Freyer, *Über das Dominantwerden technischer Kategorien in der Lebenswelt der industriellen Gesellschaft*; A. Gehlen, *Die Seele im technischen Zeitalter*; and H. Schelsky, *Der Mensch in der wissenschaftlichen Zivilisation*.
21. H. Schelsky, *Der Mensch in der wissenschaftlichen Zivilisation*, pp. 21-22.,
22. Cf. A- Gehlen, "Über kulturelle Kristallisation," in *Studien zur Anthropologie und Soziologie*.
23. Cf. *Ibid.*
24. *Das Ende der Utopie*, p. 11ff.
25. *Ibid.*, p. 14.
26. Cf. for this P. Sedgwick, "Natural Science and Human Theory," p. 169; "One's principal objection to Marcuse cannot then rest on his pessimism, but on his thoroughgoing mechanism: his hope and despair are equally based on some assumption of a constant, predeterminate technological threshold that can in itself function either to exclude or to impel the action of the class."





## CHAPTER TWELVE

# The Bias Of Technology

Andrew Feenberg

### Neutrality and Bias: An Ambiguous Critique

Herbert Marcuse's *One-Dimensional Man* appeared in 1964, at a time when both Marxism and liberalism were unanimous in their praise for the new technological society coming into being. The appearance of Marcuse's sharp critique of technology was a surprise. It is now easy enough to attach Marcuse's ideas to a tradition of Marxist technology criticism, but at the time that current ran underground and was invisible to all but a few aficionados of 20th century intellectual history. Such soon- to-become classics as Lukacs' *History and Class Consciousness* and Adorno and Horkheimer's *Dialectic of Enlightenment* were untranslated and out of print, scarcely mentioned in the few works that noticed their existence at all

The immediate impact of Marcuse's book was atmospheric rather than academic. It contributed to a rapidly growing climate of resistance to the technocratic dystopia feared by the newly emerging cultural and political opposition of the 1960s. Marcuse's name became a symbol of these oppositional currents and, in response, his ideas were attacked as antitechnological and anti-scientific. This was the real scandal of *OneDimensional Man*, which outraged readers on the right and the left even more by its critique of progress than by its social and political radicalism.

In this chapter, I propose to re-examine Marcuse's critique of technology from a distance, so to speak, outside the context of its time and



the debates it sparked, strictly in terms of its theoretical contribution. I will show that Marcuse's critique of technology, while radical indeed, does not imply an irrationalist hostility to science and reason as is often supposed. The demonstration will require not only a break with the accepted image of Marcuse, but also with the peculiar rhetorical strategy of his later works. His style is itself a conscious provocation, a refusal of the accepted canons of academic discourse. The effectiveness of this strategy can be measured by Marcuse's remarkable impact. However, there is a cost: the constant compression of ideas into dramatic formulations emphasizes the dialectical connections, but often obscures the meaning of the concepts so connected.

Here is a passage from *One-Dimensional Man* which can serve as an example of the difficulties of Marcuse's style, while introducing the main themes of the discussion to follow.

Technology serves to institute new, more effective, and more pleasant forms of social control and social cohesion . . . . In the face of the totalitarian features of this society, the traditional notion of the "neutrality" of technology can no longer be maintained. Technology as such cannot be isolated from the use to which it is put; the technological society is a system of domination which operates already in the concept and construction of techniques . . . .

As a technological universe, advanced industrial society is a *political* universe, the latest stage in the realization of a specific historical *project* - namely, the experience, transformation, and organization of nature as the mere stuff of domination. As the project unfolds, it shapes the entire universe of discourse and action, intellectual and material culture. In the medium of technology, culture, politics, and the economy merge into an omnipresent system which swallows up or repulses all alternatives. The productivity and growth potential of this system stabilize the society and contain technical progress within the framework of domination. Technological rationality has become political rationality.<sup>1</sup>

Marcuse's basic claim is that there is an essential connection between modern technology and the domination of man by man in the existing industrial societies. He asserts this claim by employing two familiar concepts - domination and technology - in a strange and unfamiliar combination: technology *is* domination and vice versa. By "technology" Marcuse means just what we would expect: machines, industry. His concept of domination refers to the suppression of the individual by society, both in the external form of exploitative hierarchy and coercive power, and the internal or "introjected" form of conformism and authoritarianism. (Despite the claims of his critics, Marcuse never extended his critique of domination to a rejection of all authority in society and moral conscience in the individual.) Thus Marcuse's argument holds that today the machine is not merely *used* for the purpose of suppressing individuality but that it is the basis for new types of suppression it alone

makes possible and which it is in some sense destined to carry out.

Marcuse's dialectical style works on the ambiguities of certain terms in a way which is both illuminating and confusing. When he writes, for example, that science is "political/" or that technology is "ideological," he makes the strong point that science and technology cannot be understood outside their connection with the historical universe in which they function. Yet in making his point in this way, Marcuse blurs the essential difference between science and technology, on the one hand, and politics and ideology, on the other. He might be taken to mean that, as ideology, science and technology are nothing more than the rationalization of the interests of a particular class. But then opposition to that class would include opposition to "its" science and technology. This view is undoubtedly irrationalist, and bears a certain ominous resemblance to romantic critiques of technology which call for a return to religious values or a simpler, pre-technological way of life.

Yet this is not at all Marcuse's intent. Despite his sharp criticism of "technological rationality/" he still maintains the old Marxist faith in the ultimate liberating potential of technology. Technology still represents for Marcuse the hypothetical possibility of overcoming scarcity and the conflict to which it gives rise, but capitalism "represses" this technical potential for emancipation by casting society in the form of an ever renewed struggle for existence.

To avoid an irrationalist misrepresentation of his position, Marcuse is obliged to offer correctives to his strong critical claims, asserting the neutrality, validity and instrumental effectiveness of science and technology

i. despite their "ideological" character. Thus he asserts with equal assurance that "technology has become the great vehicle of - *reification*," and that "science and technology are the great vehicles of I/ liberation."<sup>2</sup> He writes:

If the completion of the technological project involves a break with the prevailing technological rationality, the break in turn depends ; ; on the continued existence of the technical base itself. For it is this

base which has rendered possible the satisfaction of needs and the reduction of toil - it remains the very base of all forms of human freedom. The qualitative change lies in the reconstruction of this base - that is, in its development with a view of different ends . . . .

The new ends, as technical ends, would then operate in the project and construction of the machinery, and not only in its utilization.<sup>3</sup>

The mutually cancelling formulae do actually add up to a theory, but one that is buried in the interplay of the inadequate concepts used to present it. The meaning of Marcuse's theory is clouded by the lack of explicit ' distinctions; he insists, rather, on making distinctions implicit in the use ■ ' and context of his concepts. But his rhetorical strategy is clear enough:

' from a variant of the Marxist position he extracts results that one would ; expect from the irrationalist critique. He wants to both have tus ■; conceptual cake and eat it too, making the strongest possible critique of technology without paying the "luddist" price.

The conceptual chaos that results from this procedure has confused Marcuse's critics and even the most sympathetic have drawn back from his more radical formulations. Their reluctance gains authority from Marcuse's own attempts to rectify his aim by waffling occasionally on his strongest claims. Thus, at one point he states that a computer or a cyclotron can equally serve capitalism and socialism, apparently oblivious to the fact that, if this is taken as a general example, it seems to invalidate his own argument that "technology as such cannot be isolated from the use to which it is put." Habermas, among others, has taken this concession to mean that Marcuse really believed in the political neutrality of technology all along.<sup>4</sup> Another critic, Joachim Bergmann, has pointed out that without a distinction between the purely neutral technical resources of advanced societies and their actual realization in particular ideologically biased technologies, there can be no critique of "repressed potential" such as Marcuse wishes to elaborate.<sup>5</sup> How indeed would one measure this potential if it were not with respect to purely technical powers, abstracted from specific social embodiments in particular technologies and therefore also from whatever political or ideological function these technologies may serve?

Worse yet, in his considerations on the new emancipatory technology, Marcuse seems to waver back and forth between the utopian idea of a technology that liberates nature in responding to human aesthetic needs, and the "realistic" affirmation that basic needs will continue to be served by the very "technological rationality" he condemns so sharply for its connection to domination.<sup>6</sup> But the core of Marcuse's argument holds that in a liberated society technology as a whole would contribute to freedom precisely through serving basic needs in a new way. This would mean a new direction for progress, not the addition of a thin veneer of "humanized" technology on the surface of a world engineered in all its essential features to the destruction of man and nature.

It is puzzling that Marcuse did not arrive at a *clearer* formulation of his theory in response to his critics. It seems unlikely that terminological failings and rhetorical temptations suffice as an explanation for his problems. I will argue that many of the difficulties in Marcuse's position stem from the fact that it has two independent but converging sources. The first of these sources is the classical Marxist theory of the alienation of "free labor" in capitalist society. This strand of the theory leads directly to the promise of a disalienated industrial society in a socialist future, a future for which, Marcuse readily admits, there is still no precedent.

However, there is another strand to Marcuse's argument which holds that technical reason is a priori adapted to the maintenance of social domination, not just under capitalism and in response to the class interests of capital, but essentially, *in itself*. This position seems closer in spirit to critics of technology such as Martin Heidegger or Jacques Ellul who are frequently described as romantics. It is this "romantic" or better still "ontological" strand of the theory which leads to Marcuse's rejection of "the traditional notion of the 'neutrality' of technology," and his belief that technical reason cannot be adapted to the requirements of a free society without fundamental transformation.

Rather than resolving the tension between these two sources of his views, Marcuse seems to have used each as a corrective for the excesses of the other. Where Marxism tends toward technological optimism, Marcuse drew on his more radical critique of technical reason to sharpen the issues. Where that radical critique tends to slide into a metaphysical despair, Marcuse drew back from the comfort of the abyss with a Marxian emphasis on the concrete social causes of distress and misery.

I am not convinced that Marcuse reconciled these positions successfully, but his attempt is extremely interesting and invites us to further reflection on the issues he raised. Can we, through the further elaboration of Marcuse's own concepts, bring these two approaches to the critique of technology together? This is the difficult question of the internal consistency of a radical critique of technology such as Marcuse's. I will address it in the remainder of this chapter.

### The Neutrality of Technology

Perhaps the best way to gain a deeper insight into Marcuse's position is to focus on his assertion that "the traditional notion of the 'neutrality' of technology can no longer be maintained." Here is a claim that runs through his whole critique of technology. Yet in reality, Marcuse's rejection of the neutrality thesis is by no means so categorical as it seems. What is the traditional notion of the neutrality of technology, and with what new conception does Marcuse propose to replace it?

The neutrality of technology consists first of all in its indifference, as pure instrumentality, to the variety of ends it can be made to serve. In this sense of the term, the neutrality of technology is merely a special case of the neutrality of instrumental means, which, in themselves, stand essentially under the norm of efficiency but are only contingently related to the substantive values they may be made to serve in concrete applications. This conception of neutrality is familiar and self-evident.

There is a second sense in which technology is said to be "neutral." Not only is technology claimed to be indifferent with respect to ends, but it also appears to be indifferent with respect to culture, at least among the modern nations, and especially with respect to the political distinction between capitalist and socialist society. A hammer is a hammer, a steam turbine is a steam turbine, and such tools are useful in any social context, assuming the existence of a suitable technical infrastructure to support their employment. In this respect, technology appears to be quite different from legal or religious institutions, which cannot be readily transferred to new social contexts because they are so deeply embedded in the institutional structure of the society of their origin. The transfer of technology, on the contrary, seems to be inhibited only by its cost.

The sociopolitical neutrality of technology is usually attributed to its "rational" character and is related to the universality of the truth embodied in the technology, a truth which can be formulated in verifiable causal propositions. Insofar as such propositions are true, they are not socially and politically relative but, like scientific ideas, maintain their cognitive status in every conceivable social context. Hence, what works in

one society can be expected to work equally well in another.

The rational universality of technology also makes it possible to apply the same standards of measurement to technologies employed in different settings. Thus the progress of technology is routinely said to increase the productivity of labor and social wealth in comparisons not only between different countries but also between different eras and different types of societies.

In opposition to these widely accepted views of the neutrality of technology, Marcuse asserts that technology is fundamentally biased toward domination. His alternative position can be formulated as follow- in three "theses," each of which summarizes an aspect of his argument.

1. Technology as a means is not politically innocent because, even as it serves generic ends such as increasing the productivity of labor, its specific design and application in the existing industrial societies forms the basis for a way of life that involves the domination of man by man. In this sense, the means (technology) are not truly "value free" but can be said to include within their very structure the end of preserving the status quo.

2. Technology as a total system, a cultural formation, takes the place traditionally occupied by ideology in legitimating the existing society, it thereby forecloses opposition to the wrongs of the society, obstructs progress in its humanization, and sustains the continuity of domination inherited from the past history of class society.

3. Scientific-technical rationality is a priori adapted to the maintenance of social domination.

These theses contradict the conventional view of the neutrality of technology described above. Marcuse insists on linking means and ends, denies that technology is indifferent with respect to the alternative of capitalism or socialism, and challenges the apparent value-freedom of technological rationality. And yet, as we have seen, Marcuse's insistence on the possibility of a transition to socialism based on the "reconstruction" of existing technology implies some sort of notion of the neutrality of technology, albeit a different one from the "traditional notion" he rejects.

But what kind of neutrality would be compatible with Marcuse's claim that technology in advanced industrial societies is designed to serve the end of domination? What peculiar kind of neutrality can describe scientific-technical reason if it is a priori biased toward domination? Is thi-. not a contradiction in terms? Or is it possible that neutrality and bias can coexist together?

I will argue that neutrality and bias can and do in fact coexist and that Marcuse's theory rests on the possibility of their coexistence. It raa'j be helpful here at the outset to make the reasons for this position dear. J wilt attempt to do so at first in terms that are not internal to Marcuse's highly speculative discussion of the same topic in his critique of formal rationality. I hope that by beginning in this way I will be able to make the general line of Marcuse's approach more plausible by clearly distinguishing between the type of bias that Marcuse attributes to formally neutral systems such as science and technology and the more familiar type o t cnas that characterizes ideologies, prejudices and discriminatory arrangement', of all sorts.



### **Substantive and Formal Bias**

Marcuse's position on technology implies that bias is not the opposite of neutrality, and that bias in fact cuts across the distinction between ideological and neutral elements of social systems. To my knowledge, the first recorded statement of this position is in Plato's *Gorgias* where Callicles rejects the laws on the grounds that their neutrality, which takes the form of equal treatment of the strong and weak, responds to special interests of the weak. He argues,

I can quite imagine that the manufacturers of laws and conventions are the weak, the majority, in fact. It is for themselves and their own advantage that they make their laws and distribute their praises and their censures. It is to frighten men who are stronger and able to enforce superiority that they keep declaring . . . that injustice consists in seeking to get the better of one's neighbor. They are quite content, I suppose, to be on equal terms with others since they are themselves inferior.<sup>7</sup>

It is curious that Marcuse's attempt to revive the critique of neutrality should follow Callicles in attributing bias to law - although in this case it is not legislation but science that is in question - and yet arrive at the opposite conclusion so far as the beneficiary of the bias is concerned, connecting scientific law to the interest in domination of the strong. This reversal is undoubtedly related to changes in the concept and function of reason in advanced societies as compared with classical antiquity.

Callicles' critique of law shows clearly that there are not one but two quite different types of bias that we normally distinguish in criticizing unfair actions and institutions. In the first place, there is the bias that results from applying different standards to individuals where they ought properly to be judged by the same standard. Racist discrimination is in this category. Second, there is a more subtle form of bias which consists in applying the same standard to individuals but under conditions that favor some unfairly at the expense of others.

This second form of bias is present in a great many different contexts, and it is often difficult to identify. It characterizes conditions in which "formal" equality contradicts biased social "content," such as where equality before the law is systematically frustrated by the unequal ability to pay for legal representation, or where equal educational opportunity is denied not by discriminatory exclusions but by teaching a class or ethnically biased cultural heritage that is difficult for the unfavored groups to learn. This type of bias is also present wherever procedures based on equal treatment for all are introduced or suspended according to instrumental considerations at times or places favoring the interests of one group at the expense of others. This is the case, for example, in certain countries where military leaders respect the results of elections only when the candidates of which they approve win office. For reasons that should become clear in a later section of this chapter, I will borrow a distinction

from Max Weber's theory of rationality, and call the first type "substantive" bias and the second "formal" bias.

The epistemological implications of these two types of bias are very different, representing two different types of methodological error. Substantive bias, based on the application of unequal standards, is most often associated with prejudice, with explicit norms that discriminate between people of different classes, races, sexes or nationalities. However, since it is difficult to justify unfair treatment on the basis of mere personal preferences, such norms are generally represented as factual judgments arbitrarily attributing abilities or merits, disabilities or demerits to the more or less favored groups. The epistemological critique of such bias proceeds by showing up these pseudo-factual judgments as "rationalizations," or, where they are highly elaborated, as "ideologies."

Formal bias implies no necessary feeling of prejudice, nor is it associated with factual errors based on rationalization of feelings. On the contrary, the facts, honestly reported, generally support claims of fairness aimed at justifying this type of bias, so long as their selection carefully excludes embarrassing contextual considerations. Outside the larger context, fair treatment seems to be rendered through an equal application of the same standards to all. But in that context, it becomes clear that the apparent fairness of the system, taken in isolation, hides the systematic unfairness of the results of its application.

Criticism of formal bias therefore requires redefining the relevant domain of considerations that need to be taken into account in judging the action or institution in question. It is not the particular factual claims advanced in favor of the discriminatory activity that are challenged, but the horizon under which those facts are defined as the totality of relevant considerations. The enlargement of the cognitive horizon in such cases involves passing from arbitrarily isolated elements to a larger system which embraces them all and grants them their functional significance. Thus to show discrimination in the case of a culturally biased test, it is **necessary** to demonstrate that the discriminatory outcome is functionally related to the goals of the dominant social groups.

Criticism of this type is compatible with various epistemological stances, among which is the Hegelian-Marxist approach of Marcuse. This form of critique implies an epistemology based on essential relations in a functionally structured whole. Its proponents sometimes refer to the Hegelian distinction of "abstract" and "concrete" to explain their approach. For Hegel, the "abstract" is not the conceptually universal but the part isolated from the whole to which it properly belongs. "Concrete" is the network of relations binding the parts to the whole.

In Marxist terminology, a methodology is "reified" if it insists on working with such "abstract" elements, refusing systematically to enlarge its horizons of explanation to the dimensions of the "concrete" wholes through which the parts take on their meaning and significance. A society is likewise "reified" if its structure systematically obscures the inner connections between its various sectors and institutions, protecting them from critical scrutiny by the uninformed observer. On these terms.

advanced industrial societies exhibit a typical reification through which the formal bias of their institutions is occluded. "One-Dimensional" thought is complicit in this bias in so far as it refuses the critical-theoretic gesture of enlarging the contexts of explanation to encompass the concrete whole.

### Technique and Technology

A considerable advance in understanding Marcuse's position on technology can be made from the standpoint of the distinction between substantive and formal bias. Typically, critics of technology like Marcuse find themselves accused of irrationalism because they are believed to be attributing what I have called substantive bias to technology. This would amount to saying that technology, like religious beliefs or social customs, has validity only in so far as it is part of the shared myths of the society to which it belongs. The scientific-technical principles underlying technologies would have to be treated on the same terms as magical rituals or political doctrines. The logical order of the scientific-technical disciplines would be as empty of intrinsic meaning as the rules of chess or bridge. This position is clearly incompatible with the Marxist one, to which Marcuse subscribes, according to which the science and technology developed under capitalism form the basis for an advance to socialism, subject to the necessary "reconstruction," to be sure.

In fact, Marcuse attributes formal rather than substantive bias to science and technology. If it is difficult to see this implication of Marcuse's theory, part of the reason lies in his lack of a clear terminology in which to express the moment of truth in the idea of the neutrality of technical reason.

The distinction required by Marcuse's theory can be made by abstracting the level of application of objective knowledge of nature embodied in technologies from their concrete social realization. As a matter of convenience, it makes sense to reserve the term "technique" for specific technical elements, such as the lever or the electric circuit, which are in themselves neutral with respect to concrete social ends. These elements are like the vocabulary of a language; they can be strung together to form a variety of "sentences" with different meanings and intentions. "Technologies," defined as developed ensembles of technical elements, are greater than the sum of their parts. They meet social criteria of purpose in the very selection and arrangement of the intrinsically neutral elements from which they are built. These social purposes can be understood as "embodied" in the technology and not simply as an extrinsic use to which a neutral tool might be put. Thus the study of any specific technology ought to be able to trace the impress of a mesh of social determinations which preconstruct in some sense a whole domain of social activity aimed at quite definite social goals.

On the basis of this distinction, it is possible to construct an approach. With the critical results Marcuse seeks to achieve, that is, to show that social values penetrate technologies despite the fact that technologies embody an objective knowledge of nature with a quite different

epistemological status from such socially relative phenomena as customs, political institutions or religious beliefs. In the case of technologies, values can be shown to operate in the choice of technical elements and the resulting "fit" of the formally rational technological subsystems and society at large. The bias originates not in the formal system itself but in its concrete realization in a real world of times, places, historical inheritances, in sum, a world of concrete contingencies.

This explains why "reconstruction" of technology is a possible and necessary feature of the transition to socialism. The social environment of the transitional society is in flux and the old "fit," which favored certain groups at the expense of others, no longer works. A new way must be found of organizing the formally neutral materials from which technologies are built up, appropriate to the new society growing up around them.

The traditional notion of the neutrality of technology discussed earlier represents the reified approach to formal neutrality. It succeeds in demonstrating the value-freedom of technology precisely to the extent that it abstracts from all contextual considerations. Marcuse's method consists in recovering these lost contexts through which finally it is possible to develop a historically concrete understanding of technology. But it is also important to note that in this as in other instances of formal bias, the decontextualized elements from which the biased system is built up *are* in fact neutral in their abstract form. The illusion of technological neutrality arises from the attempt to understand socially concrete technologies on the model of the abstract technical principles they embody in a unique and value-laden combination.

The first two theses on technology which I have attributed to Marcuse flow directly from these considerations. They reflect the social consequences of the systemic involvement of technologies in a society based on class rule. These theses summarize the Marxian "moment" in Marcuse's critique of technology. They will be treated in the next section of this chapter. The third thesis has a different status. It attributes intrinsic bias to the formally neutral materials, the very scientific-technical rationality, from which technologies are built up. This is the other strand in the Marcusean critique, the "ontological" moment. This strand of the argument aims to uncover what might be called the ontological preconditions for the possibility of formal bias. Why, in fact, are formally biased systems so commonplace in modern societies? Can it be an accident that formally neutral concepts and procedures lend themselves so readily to applications we consider misuses or abuse<sup>1</sup>? Marcuse's response will be treated in a third section of this chapter.

### *The Marxian Moment: Technology and Class Power*

Marcuse interprets Marx's theory of alienation as a critique of capitalist technology. Despite the widely held view that Marx was a latent technocrat, this interpretation of his position finds considerable support in early sections of *Capital* and the *Grundrisse*. In these texts, Marx attempts to understand how capitalism has fused the drive to increase

economic productivity, and the equally important drive to maintain capitalist power on the workplace.

To the extent that workers are divorced from the means of production, the control of their labor falls to the capitalist owners of enterprise, who must devise technological and managerial solutions to the problems of labor discipline. Thus Marx writes that

the control exercised by the capitalist is not only a special function due to the nature of the social labour-process, and peculiar to that process, but it is, at the same time, a function of the exploitation of a social labour-process, and is consequently rooted in the unavoidable antagonism between the exploiter and the living and labouring raw material he exploits.<sup>8</sup>

Technological choices, *like all* other aspects of production, are determined by the *fact that* the pursuit of efficiency involves the imposition of effective control, not only over nature, but also over human beings at work. Technological progress is subtly influenced by this requirement. It proceeds under the aegis of two goals, a purely technical and a socially specific goal, one serving generic human interests and the other serving class interests.

These considerations explain how the very same Marx who foresaw the liberation of humanity in a technologically advanced socialist society could also be the author of sharply critical diatribes against the division of labor and the use of machinery under capitalism. He wrote of science, for example, that it "is the most powerful weapon for repressing strikes, those periodical revolts of the working class against the autocracy of capital."<sup>9</sup> And in another passage, Marx claims that "it would be possible to write quite a history of inventions, made since 1830, for the sole purpose of supplying capital with weapons against the revolts of the working class."<sup>10</sup>

Arguing in part on this basis, Marcuse writes that "the machine is *not neutral*; technical reason is the social reason ruling a given society and can be changed in its very structure."<sup>11</sup> What is new in Marcuse's formulation is the passage from a critique of *technology* to a critique of *technical reason*. This is certainly not in Marx, although it is possible, as Lukacs demonstrated, to develop such a critique out of Marx's theory of economic fetishism and his attempts at explaining the way in which capitalist economic science masks exploitative relations in the economy. In his essay on Max Weber and in *One-Dimensional Man*, Marcuse attempts to derive his critique of technical reason directly from the Marxian theory of the dual criteria of progress under capitalism. A consistent interpretation of one major strand of Marcuse's argument can be drawn from this source. This interpretation holds that technical reason has been distorted by the same forces that have distorted technological development. I will present such an interpretation very briefly below. ...

In his essay on Weber, Marcuse shows how Weber's explanation of the general concept of formal economic rationality implicitly presupposes "the separation of the workers from the means of production ... (as) a *technical*

necessity requiring the individual and private direction and control of the means of production — The highly *material*, historical fact of the private-capitalist enterprise thus becomes ... a *formal* structural element of capitalism and of *rational* economic activity itself."<sup>13</sup> Thus the terms in which Weber comprehends the social world introject the given forms of domination as a priori bases of conceptualization. Marcuse considers Weber's analysis to be significant in revealing by its example the generally ideological character of formal social concepts under capitalism. The definitions of social objects, the criteria of means/ends rationality, concepts of efficiency, progress and so on all exhibit this a priori bias toward domination.

This explains why capitalist technical concepts are operational in themselves and do not require constant reference to an explicit sociological analysis to be employed. The concept of "efficiency," for example, implicitly includes domination of the labor force without reference to the problems of capitalist labor discipline because such domination is already implied in the very notion of means/ends rationality in this society. What Marcuse calls the "technological rationality" of this society is indelibly marked by the presupposition that domination is the necessary condition for effective control. The trace of this presupposition can be found in economic thought, managerial methods and the design criteria of technology itself.

*One-Dimensional Man* takes this argument still further by showing the ideological function of such capitalist-distorted forms of technical rationality in advanced society. Marcuse argues that today technological rationality is no longer simply biased in its operational employment, but has become a legitimating mechanism for the perpetuation of domination. This thesis carries us well beyond the Marxian position. In Marx's theory, capitalism is still subject to criticism on the grounds of technical inefficiency. Since alienation has become an obstacle to the growth and development of the productive forces, the normative goal of creating a more humane society is in conformity with the purely technical goal of increasing economic productivity. The critique of capitalism can thus proceed simultaneously on technical and normative grounds.

Marcuse believes this original Marxian position has been invalidated by the progress of contemporary capitalism. Technical considerations no longer demonstrate the inadequacy of the capitalist organization of production. Technological rationality can no longer serve, as it still did for Marx, as the basis of a critique of the prevailing relations of production, but becomes, in fact, the legitimating discourse of the society. Habermas summarizes this aspect of Marcuse's theory.

At the stage of their scientific-technical development, then, the forces of production appear to enter a new constellation with the relations of production. Now they no longer function as the basis of a critique of prevailing legitimations in the interest of political ... enlightenment, but become instead the basis of legitimation. *This* is what Marcuse conceives of as world-historically new.<sup>13</sup>

Under these conditions, technological rationality tends more and more to support the system as the (apparently) only efficient way of operating a technological society. The problem is no longer the inability of capitalism to make effective use of the technologies it has developed, but rather the catastrophic human consequences of the effective use of these very technologies.

Not only is technical progress distorted by the requirements of capitalist control, but the "universe of discourse," public and eventually even private speech and thought, limit themselves to the posing and resolving of technical problems within the double constraints of the simultaneous interest in technical advance and domination that characterizes capitalist rationality. "When technics becomes the universal form of material production, it circumscribes an entire culture; it projects a historical totality - a 'world.'"<sup>14</sup> The universalization of technical modes of thought changes the cultural conditions presupposed by the Marxian theory of emancipatory struggle. There is no place for critical consciousness in this world: it is "one-dimensional." The normative critique is thus forced to appear explicitly and independently; it can no longer hide behind the Marxian demand for a liberation of the productive forces to full development.

This explains why Marcuse, unlike Marx, not only attacks the dominant social interests that preside over technological choices, but also criticizes technical modes of thought and criteria of progress. His critique is directed at "technological rationality," a self-propelling system of domination through technology, increasingly out of control of its human masters. He writes that "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 spheres of culture."<sup>15</sup>

### Socialism and Reason

How deep is the challenge to rationality posed by this "Marxian moment" in Marcuse's theory? As summarized above, the theory in fact has no irrationalist implications. Yet it is often difficult to isolate this strand in Marcuse's argument from the other far more radical ontological critique of technology, and the terminological shortcomings of Marcuse's argument exaggerate the difficulty unnecessarily.

The significance of this strand of Marcuse's argument becomes clearer when it is viewed in its political context. Despite the political discouragement implied by his conclusion, Marcuse's theory quickly inspired widespread critical discussion in advanced societies. Some of this criticism was irrationalist in the proper sense of the term - Marcuse was himself criticized as "soft" on technology by Roszak and others he influenced. But Marcuse's influence flowed also into other intellectual currents that pressed for a critical rationalism, independent of political power and its so-called "experts," and able to assess the social world historically and philosophically in opposition to the dominant overemphasis on quantitative methods and social engineering. The

outcome of this tendency included such characteristic and essentially positive phenomena of the 1960s as a growing rejection of the technocratic pretensions of both capitalist and communist elites, movements for selfcriticism among professionals, and the interest in "appropriate technology," and environmental reform.

All these developments have in common an implicit reference to a level of technical rationality purified of exploitative features by a historically informed critique. The doctor critical of current medical practice or the teacher involved in the radicalization of his or her discipline does not generally aim to destroy the technical underpinnings of his or her own work, but to identify the ways in which bourgeois society has penetrated and distorted these underpinnings. A new "paradigm" is required, not an alternative to reason. Marcuse's theory opens the way to just such a critical search for new paradigms by identifying the point at which technical reason becomes historical, that is to say, *class* reason through introjecting the specific requirements of capitalist control at its basis.

From this standpoint, we are returned to something very much like Marx's own views on the transition to socialism, insofar as they can be inferred from his scattered remarks on the subject. Marx rejected utopian thinking in favor of the idea of a dynamic process of social change which would start out with the capitalist inheritance and gradually transform it under the conditions of a new class power. While Marx did not apply this schema explicitly to technology, it can be inferred from his harsh critique of the capitalist factory that he envisaged radical changes in its design and employment under socialism, long before the transition to the highly automated system projected in some of his more speculative writings. The reshaping of inherited technology can be understood as a process of bootstrapping. The technology would not be thrown out, nor would it simply be put to new uses in a different social context, but rather it would be employed to produce new technological means, fully adapted to the requirements of a socialist society.

It is important to distinguish clearly between this developmental approach, and the notion that the technology developed under capitalism is neutral with respect to social systems, that the same means can be used for different ends. Marx's position suggests the further relationship: not what different *ends* may be directly served by a given technology, but what new technological *means* it may produce, in a technically and culturally feasible sequence leading from one type of industrial society, oriented toward certain definite values, to a quite different type of society oriented toward other values. Marcuse makes this alternative clear in writing that, "what is at stake is the redefinition of values in *technical terms*, as elements in the technological process. The new ends, as technical ends, would then operate in the project and in the construction of the machinery, and not only in its utilization."<sup>16</sup>

The Marxian moment in Marcuse's critique of technical rationality reaches its extreme limit at this point. The historically institutionalized forms of technical reason, whether they be technologies or professional specializations or social sciences, fall before a critique which reveals their inhumanity in revealing their limitations *qua* technical reason. Rut



reason itself emerges unscathed, in fact purified by the fixe of criticism, its ultimate neutrality confirmed by the critical glance that strips it bare of sociological accretions. This is the paradox of the Marxian moment, that it can only achieve a historically concrete critique of reason's bias toward domination by gesturing toward an abstract ideal of truly neutral technical reason, undistorted by power and ideology.

Is this enough? Can criticism stop short at this point, essentially the point where Marx stopped, without risking a collapse into renewed positivity, naive rationalism, perhaps even technocracy? This is truly the parting of the ways. A version of critical theory can be elaborated starting out from the Marxian moment in Marcuse's critique of rationality. Such a version of critical theory has the immense advantage, in terms of gaining wide acceptance and producing conviction, of requiring no metaphysical concepts, and can be elaborated against a background of common assumptions about the nature of reality. But Marcuse did not accept this position. He insisted stubbornly and to the last on pushing the critique far beyond this point, attacking the metaphysical roots of the problems, braving the scorn of empiricist and neo-Kantian alike by proposing a speculative theory of reason more deeply critical than the one sketched above, more surely protected against affirmative regressions.

Here is where the second strand in Marcuse's critique of technology comes in. This "ontological" critique is based on the refusal to separate technology and technical reason per se from the social and cultural framework within which they operate. The technical reason on the basis of which modern technology has been developed may in itself be "neutral" in some sense, but it is an abstraction insofar as it is considered outside the entire context of involvements in which it emerged as theory and to which it returns as practice. Technical reason is not just an epistemological category but also a civilizational one. The complex formed by modern society and technology is no more neutral than medieval cathedrals or Egyptian pyramids, but embodies the specific values of a particular civilization, Western civilization, the civilization of "Reason." The task of the philosopher, from this standpoint, is to articulate and judge these values embodied in technology and in the course of doing so to uncover the bias of reason itself.

### The Ontological Moment: The Radical Critique of Technology

The preceding discussion has shown that Marcuse's theory of technological bias implies the neutrality of technique. We are now ready to consider his demonstration of the complementary point that the neutrality of technique implies in its turn a kind of bias. This is Marcuse's most controversial thesis on technology, according to which there is an intrinsic a priori connection between scientific-technical rationality and domination. According to this thesis, "science, by virtue of its own method and concepts, has projected and promoted a universe in which the domination of nature has remained linked to the domination of man."<sup>17</sup>

This proposition is in some sense shocking, and the consensus of

Marcuse's critics has been entirely negative as far as it is concerned. Such generally sympathetic critics as Habermas and William Leiss dismiss it as a vestige of romantic nature philosophy.<sup>18</sup> Not only is this position extremely unpopular, it is far more difficult to understand than the themes treated above. It stems from a different tradition, less widely known and followed in the United States than even the Marxism which inspires Marcuse's other ideas on technology. This tradition begins with Hegel's critique of the "understanding," and, more specifically, of scientific quantification and lawfulness. It continues in Nietzsche's genealogy of the "will to truth," and his attempt to demonstrate the power drive behind rationality. Finally, Marcuse himself is strongly influenced by the development of these themes in the work of contemporaries, primarily, Husserl, Heidegger, Lukacs, Adorno and Horkheimer.

With the possible exception of Hegel, all these thinkers reject the representation of scientific objectivity as detached and disinterested knowledge. They are all engaged in demystifying what Nietzsche calls the "last idol," the ideal of "truth" conceived as the absolute vision of a subject which, as knower, situates itself beyond the world. It is important to note that the emphasis of this critique is not on human fallibility, and the critique is not necessarily associated with scepticism. Rather, it is the traditional conception of truth itself which is in question because that conception is based on the theological assumption that truth is the sort of knowledge achieved by a disembodied, decontextualized and "perfect" subject.

According to this traditional theological notion of truth, finite subjects are not "perfect" in this same way, and can therefore achieve knowledge only by abstracting themselves from their facticity as embodied, sensuous, feeling beings. To Nietzsche and his successors it is quite arbitrary to propose a purely ideal and imaginary perfection as a standard and to measure real subjects by it. To rid the concept of truth of this theological assumption, it *must* be subjected to one or another type of radical reconstruction in accord with the ontological requirements of a conception of the universe in which even the hypothesis of an infinite subject of knowledge is dismissed as meaningless.

These requirements include the necessary involvement of the (finite) subject of knowledge in the world which it knows. But this is equivalent to saying that the subject of knowledge must be conceived first and foremost as an acting being, therefore as a being engaged with reality for essentially interested reasons. From this point of view, the customary pretensions to objectivity and detachment associated with scientific- technical knowledge appears as an ideology covering undisclosed existential involvements.

The interests masked by scientific objectivity have been variously interpreted. At the very least, the "philosophers of finitude" under discussion here see destiny at work in the relation of modern science to technology. They invariably reject the commonplace view that 'Ciencce "works" because "knowledge is power," that scientific theories are susceptible to technological application for the simple reason that they are true. Clearly, some kinds of knowledge yield power over nature, but this

must be due to an a priori orientation toward power characteristic of the most basic methods and concepts associated with those ways of knowing. Thus it is not knowledge which is power but rather power which is a form of knowledge. On these terms, formal classification under laws, cause- effect reasoning, and especially quantification have been identified as epistemological expressions of the interest in instrumental control underlying the pursuit of scientific knowledge.

This is one aspect of Marcuse's position, argued at great length with the aid of citations from Husserl, Heidegger, Adorno, and Horkheimer. However, from Marcuse's standpoint merely pointing out the internal link between science and instrumental control is insufficiently critical. This view does not really threaten the customary idea of scientific objectivity, nor does it *essentially* connect science and technology to the progress of domination.

Habermas has shown, for example, that the theory of science as instrumental reason can be worked out to its logical conclusion in complete abstraction from all political content. It proves possible to relate science to a general interest in instrumental control without actually toppling the "idol" of objectivity because, as Kant already demonstrated long ago, the generically human can be treated "as if it were true for all practical purposes. Indeed, if science represents generically human interests, it is "detached" and "neutral" with respect to all particular interests, that is to say, all really historically existing interests such as we know them. What more can one ask in the way of disinterestedness?

Marcuse goes far beyond this initial step toward a demonstration that the instrumentalist character of science binds it essentially to the practice of domination. Now this is quite a different proposition. On these terms science is truly "political," as Marcuse argues, and its pretension to occupying a neutral post above the struggles of history is shattered. But these considerations seem to imply a fundamental inconsistency between Marcuse's various critiques of technology. For, if reason is *essentially* tied to domination, then it is difficult to see how any amount of "reconstruction" of its technological products can transform them into suitable "vehicles of liberation."

Two puzzling features of Marcuse's theory are aimed at overcoming this apparent inconsistency, and reconciling the ontological and the Marxian moments of his critique. The first of these consists in the *historical* treatment of reason as an *ontological* category. Marcuse's critique of rationality is unusual in that he rejects the idea of an ahistorical category "reason," essentially burdened by transhistorical values such as the will to power. But if the nature of reason changes in history, then so, in a sense, does its object, being. For Marcuse, such basic categories as essence and existence, fact and value have a historical meaning and are not fixed once and for all by an ontology that would transcend and underlie history.

On these terms, reason (and its technological products) can be analyzed in its contemporary form as the product of forces that lie at the crossroads of ontology and history. In support of this position, Marcuse follows the lead of Horkheimer and Adorno in relating the historically specific forms of technology and reason to the emergence of class society. The technical

reason of modern capitalist societies is thus doubly determined by class power, once in the specific forms criticized in the previous section, and a second time in the vaster context of the overriding history of class society as a whole. The critique corresponding to this larger form of class determination is aimed not at distortions introduced into a fundamentally neutral technical reason, but rather at identifying the intrinsic bias in technical reason itself insofar as it emerges from the conditions and requirements of class society in general. This way of developing the critique holds open the possibility of historical change in the ontologically essential determinations of technology and reason in a classless society of the future.

This historical treatment of reason is connected to another still more paradoxical feature of Marcuse's theory. Where the irrationalist critique of reason attempts to undermine the claims of science to neutrality and objectivity by showing them to be an ideological veil for hidden interests, Marcuse argues that it is the very neutrality and objectivity of science that supplies the link between its instrumental and its repressive dimensions. He writes, for example, that "it is precisely its neutral character which relates objectivity to a specific historical Subject - namely, to the consciousness that prevails in the society by which and for which this neutrality is established."<sup>19</sup>

As we have seen, the Marxian moment in Marcuse's critique leads to recognition of the neutrality of a hypothetical technical reason purified of class distortions. The ontological moment in Marcuse's critique is designed to foreclose any possibility of uncritical acceptance of this idealized model of a purified technical reason. Technical reason is indeed neutral at some level, Marcuse will argue, but its very neutrality subserves it to domination and so ties it to the history of class society. In what follows I will attempt to explain the articulation of these two critiques in more detail.

### **The Problem of Rationality**

The best place to begin this discussion is with the attempts of Marx, Weber and Lukacs to explain the function of rationality in capitalist society. Marx demonstrated that the power of the capitalist class is reproduced through the formally equivalent exchange of wages for labor power. This demonstration opened the way to the study of the formal bias of apparently neutral social subsystems, and raised one of the fundamental questions that gave rise to the science of sociology - the question of the social significance of rationality. As a chapter in the history of attempts to answer this question, Marcuse's theory is unusual in drawing on the philosophical critique of science and technology discussed above.

Weber plays a pivotal role in the evolution leading from Marx to Marcuse. His theory of rationalization continued and enlarged Marx's approach to formal neutrality. For the purpose of this theory, Weber introduced the terms "substantive" and "formal" rationality, adapted above to the discussion of the forms of bias, to describe two different, types of social thought and action,<sup>20</sup> Rationality is "substantive" to: the

extent that it responds to norms embodying a higher purpose such as feeding a population, winning a war or maintaining the social hierarchy. The "formal" rationality of capitalism primarily characterizes those economic arrangements which optimize calculability and control and which aim directly at efficiency in production and distribution rather than at the fulfillment of "substantive" needs. Formally rational systems lie under technical norms that have to do with efficiency in the organization of means rather than the achievement of specific ends.

In Weber, the term "rationalization" refers to the generalization of formal rationality in capitalist society, often at the expense of traditional substantively rational modes of action, with paradoxical consequences for the distribution of social power. While the application of Weber's concept of substantive rationality is unclear and subject to controversy, it seems reasonable to consider precapitalist societies as substantively rational to the extent that reason enters into their organization at all. These societies exhibit a specific type of rationality that supports the power of the dominant social groups. Nowhere does one find any claim to cognitive neutrality in the forms of rationality that maintain such systems. On the contrary, their bias is explicit and rests on a hierarchy of functions presumed to be consecrated by God. Thus in these cases there is perfect consistency between the forms of rationality, penetrated as they are by substantive ends, and the discriminatory social outcomes.

This is not the case in capitalism, where the neutral forms of rationality support discriminatory outcomes despite (or because of!) their neutrality. Weber is quite aware that the outcome of rationalization *is* favorable to the ambitions and claims of certain social groups, capitalists and the bureaucracy, which tend to rise to the top of any rationalized society. Yet the formally rational systems of accounting, control, production and exchange which produce this effect are in themselves value-free. The inconsistency between this neutrality of the means and the discriminatory outcomes characterizes capitalist society as a whole.

Like Marx's theory, Weber's leads to the recognition of the discrimination resulting from the normal operation of formally rational systems such as markets, administrations, the law, and professionalization. And like Marx's theory, Weber's is subversive of melioristic attempts to soften the hard edges of a formally rationalized society. Attempts to overcome the bias introduced by formal rationalization generally proceed through new types of substantively rational systems, such as affirmative action quotas, compensatory educational programs, or provisions for aid to the poor in the exercise of their rights. But such substantively rational systems are subject to criticism on grounds of formal irrationality. These were, in fact, the terms on which Marx himself criticized proposals for redistribution of wealth under capitalism. The current crisis of the welfare state seems to confirm that if socialism is conceived merely as a substantively rational corrective to formal rationality, the result will be the dismal one foreseen by Weber - generalized inefficiency leading to the imposition of new types of control from above.

The first, and to my knowledge still the major, attempt to achieve a really penetrating theoretical explanation for the bias of rationality under capitalism is contained in Lukacs' early Marxist work, *History and Class Consciousness*. Lukacs introduced the term "reification" to describe the processes Weber had

summed up under the category of "rationalization." The difference in emphasis this change in terminology connotes is significant, for Weber still tends to see the impact of rationalization on social power as externally related to rationalization itself, whereas Lukacs conceptualizes these contextual considerations as internal to the process of reification. Lukacs brings to light the congruence of modes of thought and action that rest on the fragmentation of society, formalistic thinking, and the autonomization of production units under the control of private owners.<sup>21</sup>

This approach opens the way to a theory of socialism as more and other than a mere corrective to the injustices of capitalism. However Lukacs himself failed to pursue the discussion to its logical conclusion and did not develop such a theory. Nor did he criticize scientific-technical thought per se, but rather he confined his attack to the social sciences and the institutions of capitalism. Thus while Lukacs' theory does explain why formal rationalization supports the specific inequalities that characterize capitalism, this theory does not explain the curious "accident" that formal rationality of the scientific-technical type became available at a certain point in history as the cultural form of a system of class domination. Marcuse goes beyond Lukacs in this regard, and attempts to account for the growing political role of science and technology in advanced capitalism in terms of the essential bias of scientific-technical rationality. He aims at nothing less than a general theory of the link between formalism and class domination throughout history, and on that basis he tries to sketch the main outlines of a new society, including the forms of its scientific and technical practice.

### **The Critique of Formal Neutrality**

Like Lukacs before him, Marcuse considers the universality of bias in the rationalization process to be a *problem* and not simply an accident of world-historical scope. He writes:

Scientific-technical rationality and manipulation are welded together into new forms of social control. Can one rest content with the assumption that this unscientific outcome is the result of a specific societal *application* of science? I think that the general direction in which it came to be applied was inherent in pure science even where no practical purposes were intended, and that the point can be identified where theoretical Reason turns into social practice.<sup>22</sup>

We can rephrase the problem he poses by asking, What the significance is of the general availability of formal systems for applications that are biased to favor domination? Is there something about their very neutrality which opens them to such applications? What happened "originally" in the initial construction of the formal mode of abstraction that rendered it

pliable in this particular way?

To follow Marcuse's argument to this point is difficult because we do not normally think of formally neutral systems as essentially implicated in their applications. Rather, the involvement of formal systems in strategies of domination appears to proceed from the subject' who makes a repressive use of these systems just as he might pick up a rock and use it as a weapon. It would be comical to suggest that the rock is "biased" a priori toward such uses, that its hardness is the essential precondition by which it lends itself to violence. Marcuse's very question reverses our normal assumption that biased applications are a "distortion" or "misapplication" of formally neutral systems. But Marcuse is seeking precisely to connect formal neutrality and domination as moments in a dialectical totality. This is perhaps admissible to the extent that, unlike rocks, formal systems are human inventions created in a specific social context.

Marcuse's treatment of this problem depends on his dialectical ontology which, in turn, is based on the distinction between "substantive" and "logico-mathematical" or "formal" universal. He attempts to show why formal universals are available for repressive application, and then takes the argument one step further, to demonstrate that this availability is not accidental but proceeds from the very essence of this mode of abstraction. The outcome of this demonstration is a general theory of the possibility of the phenomena I describe with the term "formal bias," understood not as a contingent aspect of formal systems, but as an intrinsic dimension of those systems themselves.

The construction of substantive universals involves a kind of idealization, a reduction of contingency which makes possible the conceptualization of the "essence" of what actually exists. In the case of social universals such as freedom or justice, this essence does not refer directly to its given instantiations, but rather expresses their historical potentialities, beyond the confining facts of life in any existing society. For Marcuse, these potentialities are not merely ideal but are immanent to the things themselves, where they appear as internal contradictions in reality. Thus substantive universals transcend the split between "ought" and "is," and as such provide the basis of a critical consciousness which, in the course of history, learns to struggle for its realization through social action,

Marcuse's theory of substantive universals is rooted in a unique form of conceptual realism. Particulars are not independently real for Marcuse, but their essential connections to other things are perceptible only through concepts. These concepts,

are identical with and yet different from the real objects of immediate experience. "Identical" in as much as the concept denotes the same thing; "different" in as much as the concept is the result of a reflection which has understood the thing in the context (and in the light) of other things which did not appear in the „ immediate experience and which "explain" the thing (mediation)...

By the same token, all cognitive concepts have a transitive meaning;

they go beyond descriptive reference to particular facts. And if the facts are those of society, the cognitive concepts also go beyond any particular context of facts - into processes and conditions on which the respective society rests, and which enter into all particular facts, making, sustaining, and destroying the society. By virtue of their reference to this historical totality, cognitive concepts transcend all operational context, but their transcendence is empirical because it renders the facts recognizable as that which they really are,<sup>23</sup>

According to Marcuse, the dialectical concept of potentiality reflects consciousness of a demand for freedom which is present implicitly in philosophy from the very beginning. To be sure, throughout most of history, the overwhelming realities of scarcity and domination block and distort philosophical thought. As a result, the potentialities it identifies appear as an unhistorical, metaphysical dimension beyond the given. Philosophy suffers the same fate as the imagination and artistic creation. In all these domains the demand for a better reality is blunted through marginalization of the dangerous visions in which the truth attempts to shine forth. Simultaneously, the merely given reality appears to be completely disconnected from its metaphysical or artistic truth, and therefore subject to another, purely formal kind of abstraction. In Hegelian terms, the given is delivered over to "immediate facticity." Formal thinking originates in the split between essence and existence which results from the conditions of life in class society.

Formal thinking is a specific negation of dialectics, its active suppression in favor of another ontology. This type of thinking starts out from the a priori acceptance of what is and abstracts from the given not toward its potentialities but rather toward its form. Formal abstraction systematically evacuates the "content" of its objects, classifying or quantifying them in terms of the function they can be made to serve in a system of instrumental controls. Thus instead of transcending the given toward its essential potentialities, which this type of universality cannot conceptualize in any case once it has abstracted from all concrete contents and the dialectical contradictions they contain, formalism exposes its objects to manipulation, transforms them into means.

The essence of formal thinking is the refusal of precisely that mode of conceptual and practical mediation in which the potentialities of being are revealed. Mediation appears as mere fantasy, the potentialities of the given as objects of derealized evaluation or imagination. The suppression of dialectical mediation is reflected in the sharp split formal thinking sets up between reason and imagination, fact and value, reality and art. Now the "content" dialectics had identified as pointing toward suppressed potentialities is redefined as mere "value," subjective and arbitrary, with no ontological roots at all. Being is strictly defined as the object of instrumental manipulations. In recent times, formalistic positivism finally does away with even the metaphysically marginalized expressions of the tension in reality between what is and what might be.

Here is the core of Marcuse's argument. Formal universals are "value-free" in the sense that they do not prescribe the ends of the objects they



construct conceptually as means. However, they are value-laden in another deeper sense. The very conception of value from which formal universals are "free" is itself a product of the abstractive process in which formalism suppresses the dialectical concept of potentiality. Thus formalism is not in fact "neutral" with respect to the alternative of actual and potential in its objects. Rather, it is clearly biased toward the actual, what is already fully realized and present to hand.

Methodologically, this bias appears in the refusal (or rather, the inability) to integrate history and social contexts as the scene of development. Formal abstraction restricts its range to the artificially isolated, individual, given object as it immediately appears. It accepts this given being as truth and in so doing comes under the horizon of the existing society and its modes of practice. Thus the horizon of the manipulations it opens is the uncritically accepted horizon of domination under which its objects lie. These objects can be used, but not transformed, adapted to the dominant social purposes, but not transcended toward the realization of higher potentialities in the context of a possible, better society.

This is the reason why formal bias is an intrinsic possibility of formal systems. Formal abstraction cuts the essential connections between objects and their contexts in terms of which dialectics uncover their potentialities. In so doing, it ignores an important dimension of the truth of reality, that which concerns the inner tensions in its objects that point toward possibilities of progressive development. Instead, the objects are conceptualized as fixed and frozen, unchanging in themselves but available for manipulation from without. It is this way of constructing its objects that comes back to haunt formal thinking in the biased application of its products. Formal bias arises as soon as the abstracted objects it constructs are reintegrated to a real world of historical contingencies. At that point, the essential relation between the abstraction and the residue of material content from which it was abstracted is revealed as a predestination to domination. Then it becomes clear that "formalization and functionalization are, *prior* to all application, the 'pure form' of a concrete societal practice."<sup>24</sup>

The hypothetical system of forms and functions becomes dependent on another system - a pre-established universe of ends, in which and *for* which it develops. What appeared extraneous, foreign to the theoretical project, shows forth as part of its very structure (method and concepts); pure objectivity reveals itself as object *for* a *subjectivity* which provides the Telos, the ends. In the construction of the technological reality, there is no such thing as a purely rational scientific order; the process of technological rationality is a political process,<sup>25</sup>

So long as formal abstractions co-exist with the "second dimension" of substantive universals, culture is divided to reflect the real contradictions of class society. It is possible, on the terms of such a divided culture, to formulate transcending potentialities of the society. Under these

conditions, social criticism can become mass consciousness and lead to revolutionary change in the interest of realizing the emancipatory potential of the given level of technical civilization. Marxism was elaborated under just such conditions.

However, in advanced industrial societies, Marcuse argues, the second dimension is increasingly replaced by concepts drawn from the apparatus of technological rationality. As every aspect of social life comes to be articulated exclusively through technical concepts, "transcending" thought and action becomes correspondingly more difficult to conceive. The identification of social crises and injustices no longer points toward the need for fundamental social change, but instead indicates technical problems that must be resolved under the norm of efficiency. The modes of action and organization of the given society, which presuppose domination, operate as invariant, a priori concepts in the "solutions" offered, and so technological rationality takes on a distinctly conservative political cast.

The link between this form of instrumentalism and domination becomes apparent in the paradox of advanced societies, increasingly effective in controlling not only nature but also man himself. Every advance in the power of formalistic thought and action is an advance in the suppression of men. Minimally, this suppression takes the form of repressing the potentialities for peace and freedom made possible by technical progress itself. At its extreme point of absurdity, pure formalism may someday become material in the destruction of the earth through the untrammelled exercise of technical power in nuclear war.

### **Science, Technology, and Socialism: Science and Liberation**

On what condition can the advance of human intelligence and control of nature issue not in the instrumentalization and domination of man but in human liberation? In answering this question, Marcuse's thought becomes frankly speculative and utopian. He argues that reason can only serve humane purposes through the recovery of a dialectical conception of reality, in which being is recognized as fraught with potentialities for liberation. This he believes to be possible on the basis of the Marxist historical reformulation of the concept of being and the immense technical power of advanced societies. The split between metaphysical and technical goals is no longer rational, but can finally be overcome. Marcuse foresees the day when his third thesis would be rendered historically obsolete by the emergence of a new science and technology.

The exploration of these themes is really the subject of another essay on Marcuse's theory of liberation. However, the discussion of Marcuse's critique of technology would not be complete without an examination of some of its positive implications. This examination will show that Marcuse's approach is rich in speculative anticipations of the new society, but also marred by tensions and problems that result, I believe, from the lack of a conceptual framework such as one introduced above for the analysis of the forms of bias and the relation of technique and technology. It is in fact here in Marcuse's theory of liberation that the limitations of his

rhetorical strategy, based on playing off his two critiques of technology against each other, finally pose serious problems for the coherence of his position.

The worst of these problems arise in his speculations on the new science. Marcuse's critique of formal rationality helps to understand the role of scientific-technical knowledge in the elaboration of formally biased systems of all sorts, including technology. However, it is unclear from Marcuse's discussion how this can be changed. Did Marcuse wish to suggest the abolition of formal thinking in a free society? If not, in what would this new science consist?

Marcuse has far more trouble offering a plausible answer to this question than to similar ones concerning technology. There is a good reason for this. The socialist reconstruction of social systems and institutions, technologies and forms of organization can proceed through the recombination of formally neutral elements. But what raw material is available for the reconstruction of those elements themselves? How can the process of formal abstraction be transformed as Marcuse proposes without being negated as such? And yet Marcuse explicitly rejects the regression to a "qualitative physics."<sup>26</sup>

Instead he argues for the necessity of science "becoming political," incorporating human values into its very structure. And he claims that "in constituting themselves *methodically* as political enterprise, science and technology would *pass beyond* the stage at which they were, because of their neutrality, *subjected* to politics and against their intent functioning as political instrumentalities."<sup>27</sup> For example, he suggests that science would overcome the split between value and fact, essence and existence, in "quantifying" values, and he proposes that the ability of science to calculate such things as necessary food supplies shows this to be possible.<sup>28</sup> The significance of this example escapes me, for such quantification might serve besiegers starving out a city just as well as humanitarians fending off world hunger. Still more confusing is the suggestion that a new science could determine values for a socialist society, for surely Marcuse would have rejected the technocratic implications of such a proposal.<sup>29</sup> I do not believe this to be a plausible path toward a solution, at least not in Marcuse's very rough and programmatic formulations. In the domain of science, affirmative action in favor of values simply will not work.

These suggestions are characterized by the failure to distinguish between countering formal bias at the basic a priori level where it is present in pure scientific and technical knowledge, and countering such bias at the level of concrete social realizations such as technologies or institutions. Marcuse's suggestions for a radical reform of science and technique are modeled directly on effective strategies for dealing with formal bias as it appears in those latter realizations. He appears to believe that the way to remove the a priori bias of formal abstraction per se is to change the abstractive process to reincorporate the material content the exclusion of which is defining for it. Perhaps for lack of a terminology in which to state this problem, Marcuse seems unaware of it and never proposes an argument for the analogy he insists on making.

Marcuse's failure to clarify these issues adequately has consequences

that are politically dangerous, for it suggests an analogy between the very active role of political power in institutional and technological change and its role in scientific change. We have seen that according to Marcuse's ontological critique of scientific-technical reason the neutral technical elements used in the reconstruction of society are themselves biased a priori toward domination, and it is this intrinsic bias which forms the background to their effective combination in technologies that serve to perpetuate the specific forms of domination prevailing in each historical epoch. Socialism would thus be working in some sense against the grain of its materials so long as a new cognitive dispensation had not occurred. Does this mean that political intervention into the development of scientific-technical rationality is necessary, by analogy with the role of politics in technological change? It would be possible to conclude as much from the structure of Marcuse's theory. And yet nowhere does he suggest that the necessary transformation of scientific-technical rationality is a political task. Rather, it is a scientific-technical task with political implications. The distinction is critical.

This clarification of Marcuse's position should help to distinguish it from the quite different position of the "Proletcult" group to which it bears an embarrassing resemblance. Shortly after the Russian Revolution, the Proletcult argued that all culture is intrinsically ideological - substantively biased in my terms - including such supposedly neutral elements as language, technology and science. The revolution would not be complete until a new "proletarian" culture had been created and substituted for the reactionary inheritance of the past.<sup>30</sup>

The assimilation of science to the superstructures as an ideological expression of bourgeois society seemed to resolve an inconsistency in the traditional Marxist treatment of the problem. Following Engels, most Marxists attributed the genesis of modern science to the uniquely favorable conditions of early bourgeois society, while insisting that this specific historical background in no way diminished the universality of the achievements of modern science. Proletcult treated science as Marxism had always treated law, art and other superstructures, eliminating the embarrassing residue of transhistorical scientific truth from the system.

Although both Lenin and Stalin opposed this view in theory, Lysenko was able to introduce political criteria into the actual institutional structure of Russian science. The catastrophic failure of this experiment in "proletarian" science continues to inspire a widespread and justified fear that the failure to distinguish between science and ideology threatens freedom of thought.

Marcuse was, of course, aware of this history, and his discussion of science in *One-Dimensional Man* is marked by an implicit worry that he will be misread as supporting political controls over science, if not its outright abolition. Yet without an explicit concept of formal bias, he has trouble differentiating his position from that of the Proletcult. Still, his intent to do so is clear enough. The most telling evidence for this is his refusal to attack the truth claims of modern science. He writes, for example, that "contemporary science is of immensely greater objective validity than its predecessors." And he argues that under socialism,

scientific "hypotheses, without losing their rational character, would develop in an essentially different experimental context (that of a pacified world); consequently, science would arrive at essentially different concepts of nature and establish essentially different facts."<sup>31</sup> Thus not political power but scientists' own changing categories and perceptions in a radically new social environment would eventually inspire new types of questions and new theories, generated spontaneously in the course of research by scientists themselves. Presumably a similar change would occur at the level of pure technical knowledge.

The claim that such an evolution could ultimately eliminate the formal bias of scientific-technical rationality is probably not decidable in advance of the actual discoveries that would accomplish this immense revolution in the nature of reason. Philosophical study can at best hope to hold open the possibility that scientific development may proceed toward a new methodology embracing the contradictory character of reality. With respect to this possibility, Marcuse's speculations on the new science may be seen as imaginative symbols, but not as concrete proposals. The task of elaborating such proposals remains to be accomplished. It may be that new developments in science are already available to facilitate that task. There have been a number of attempts to argue this, for example by Prigogine and his collaborators. However, to examine their claims would take us far afield.

### Toward a New Technology

Marcuse's ideas on the new technology are no less speculative than his ideas on science. However, they are far more interesting and suggestive. Under socialism, he argues, instrumental action would no longer be autonomized under the horizon of the given stage in the history of domination, but would come to incorporate elements of imagination, value and artistic consciousness working toward a higher stage of historical freedom. Formal thinking and modern technology would be reconciled with the suppressed dialectical mode of thought and the historical practice of realizing potentialities it guides. This reconciliation would mark the end of the history of class society and its associated subject. It would involve the emergence of a new subject with differently ordered faculties and correspondingly new forms of practice, unlike those of societies based on the domination of man by man.

It is evident that Marcuse's argument had to lead to a sort of eschatology of Reason. If it is class society that gives rise to the split in the concept of reason that divides the dialectical understanding of essence from the formalistic achievement of control, then the end of class society will see the end of this split. The theory leads rigorously to the conclusion that the derealized dimensions of metaphysics, art and the imagination, in which essence has been confined, must now be rejoined with real life through a completely new kind of scientific and technical practice. The two worlds must become one through a final reconciliation of essence and existence, real and ideal.

Technique would then tend to become art and art would tend to form reality: the opposition between imagination and reason, higher and lower faculties, poetic and scientific thought, would be invalidated. Emergence of a new Reality Principle: under which a new sensibility and a desublimated scientific intelligence would combine in the creation of an *aesthetic ethos*?<sup>2</sup>

What would be the content of this new form of technical practice? Obviously, it would have to continue to provide the food, shelter, medical care, and other amenities of civilized life. These goods are not relative to a particular type of society but relate to universal requirements of human nature. But according to Marcuse there are other human needs that are equally vital but which have been suppressed under the conditions of scarcity and class domination prevailing in the existing technological societies. These needs are loosely defined as "aesthetic," relating to beauty: the harmony of freedom and order exemplified by great works of art, the transcendence of struggle and striving in images of peace and fulfillment.

Marcuse argues that these aesthetic needs are not merely subjective, a function of changing taste, or merely spiritual, confined to the "higher" sphere of contemplation and feeling. Rather, the realm of the aesthetic is rooted in the order of nature itself and expresses tendencies in nature which come to consciousness in and through man. Marcuse suggests the "outrageous" concept of a "liberation of nature" to describe these tendencies, not in the sense of a natural teleology, but rather in the sense "that there are forces in nature which have been distorted and suppressed - forces which could support and enhance the liberation of man."<sup>33</sup>

In a free society, the realization of these tendencies would operate not alongside or over and above ordinary technical practice, as in the marginalized world of artistic production today, but in the very practice of transforming nature to make it serve human needs.

It remains to consider whether a beginning could be made toward creating such a new form of technical practice by applying the existing scientific-technical rationality. Although Marcuse himself does not seem to be aware of it, this is in reality the question of the consistency of his two critiques of technology.

According to Marcuse, socialism is only possible on the basis of the transformation of the technology inherited from capitalism. If the technical base is conserved rather than transformed, a "fateful continuity" will link the new society with the old, and insure the reproduction of the forms of repression and alienation the revolution was supposed to overcome. However, it will be recalled that scientific-technical rationality develops according to its own internal motives, under the influence of the social environment to be sure, but not on a schedule set by political events such as revolutions and policy changes. Thus there is no reason to assume that the revolution will be accompanied by simultaneous changes in the nature of rationality. And this means that the revolution can only succeed if it is able to employ the existing scientific-technical rationality *transitionally* while awaiting a new cognitive dispensation it cannot force by

political means. How then would such transitional employment be distinguished from the sort of "fateful continuity" that would doom the revolution to failure?

Perhaps Marcuse does not pose this question because he fails to make explicit the different temporalities implied by his treatment of technology as subject to political control in contrast to science which is only loosely influenced by the environment. Unfortunately, the incompleteness of his theory on this point makes it appear either incoherent or unnecessarily utopian: Marcuse seems to call for a simultaneous and "total" revolution in so many spheres that no humanly possible social change could possibly satisfy him. His concept of the "great refusal" has been interpreted to support such a view although in fact it is the choice between lesser evils Marcuse rejects and not the achievement of positive but partial goods.

Although Marcuse does not solve this problem satisfactorily, his theory contains the means to construct a solution which avoids the excesses of both utopian technophobia and uncritical acceptance of given technology as a fate. Recall that the essential flaw in scientific-technical rationality, by which it is bound to biased application, lies in its reified decontextualization of the objects it constructs. Thus it should be possible to at least advance toward a new technology by multiplying the contexts and technical systems that interact in any given application to take into account more and more of the essential features of the object. The initial steps in this direction are obvious and concern the integration of ecological, medical, aesthetic, and work-democratic considerations into the existing technologies to begin the movement toward a better society. Thus just as technical practice now incorporates the requirements of domination in its basic structure, in a free society it would instead incorporate the requirements of peace and freedom.

### The Radical Critique of Bourgeois Culture

Marcuse's theory of socialism draws together the Marxist aim of a disalienation of industrial society, the modern avant garde's struggle for a radical desublimation of art, and the contemporary environmental critique of productivist industrialism. At the core of his positive theory is a reevaluation of the aesthetic, as the source of new needs and a new practice of freedom. He believes his theory of the aesthetic can be rooted in Marx's work, and he refers to Marx's *Economic and Philosophic Manuscripts* as the evidence for this surprising notion. He writes:

Aesthetics of liberation, beauty as a "form" of freedom: it looks as if Marx has shied away from this anthropomorphism idealistic conception. Or is this apparently idealistic notion rather the *enlargement of the materialistic base*? For "man is directly a *natural being*; he is a corporeal, living, real, sensuous, objective being" who has "real, sensuous objects" as the objects of his life \_\_\_\_\_. This is... the extension of Historical Materialism to a dimension which is to play a vital role in the liberation of man.<sup>34</sup>

The connection to Marx suggested by Marcuse is not entirely persuasive, and yet there is a larger context to Marcuse's projections which encompasses Marx as well. This context is the mood of revulsion at bourgeois culture that runs through the whole history of the European intelligensia and artistic avant gardes from the mid nineteenth century until quite recently.

It is Marcuse's relationship to this traditional radical critique of bourgeois culture which determines his positive attitude toward the future despite his abandonment of orthodox Marxist determinism. Yet even this revised form of historical hope seems eccentric in the contemporary theoretical context. In recent years, non-communist left theory has paid more and more attention to the procedural defense of socialism in terms of its potential for enlarging democratic dialogue. This approach no doubt represents a reasonable reaction to charges of totalitarianism increasingly addressed to Marxism. Yet at the same time, one wonders if the procedural emphasis is not a function of the success of the system in "delivering the goods," as Marcuse would say. To provide a substantive theory today of the "content" of freedom poses especially difficult problems since it is not immediately obvious what needs require satisfaction beyond the horizon of the advanced societies.

As a Hegelian and a Marxist, Marcuse refused to address the formal question of freedom in isolation from the content or purpose for which men and women might struggle to achieve it. If this content could no longer be found in the necessities of life, then it had to be sought elsewhere - for example in the aesthetic - if socialist theory were ever to connect with real history again. Marcuse's response to this challenge is astonishingly radical and imaginative. It flows from his critique of technological rationality as a cultural system, a way of life, a general form of social practice and corresponding needs.

Marcuse's rejection of this culture must be understood on the analogy of the rejection of bourgeois society and its culture by earlier critics. Like them Marcuse attempts to project a different way of life from that of the existing societies, one which fulfills dimensions of the human personality that are systematically suppressed today. It is this extremely radical cultural break with the existing societies that thrusts Marcuse headlong into imaginative speculations drawn from the whole history of modern artistic and political critique.

It is strange that such a radical theory, based on such sources, should be so obviously out of tune with the mood of the left today, only a few years after Marcuse's death, and yet this is the case. If Marcuse already seems to come from another era, this may be due less to the implausibility of his speculative projections than to the increasing resignation of intellectuals in the West, less and less able to imagine a truly radical break with the present.

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## NOTES

1. Herbert Marcuse, *One-Dimensional Man* (Boston, 1964), pp. xv-xvi.
2. *One-Dimensional Man*, p. 168; Marcuse, *An Essay on Liberation* (Boston, 1969), p. 12.
3. *One-Dimensional Man* p. 231-32; cf. pp. 221-22.
4. Habermas, "Technology and Science as 'Ideology,'" in *Toward a Rational Society*, pp. 88-90.
5. Joachim Bergmann, "Technologische Rationalität und spät-kapitalistische Ökonomie," in Jürgen Habermas, ed., *Antworten auf Herbert Marcuse*, pp. 99-100.
6. *One-Dimensional Man*, p. 251.
7. Plato, *Gorgias*, p. 51.
8. Karl Marx, *Capital* New York, 1906 reprint), vol. 1, p. 363.
9. *Ibid.*, vol. 1, p.
10. *Ibid.*, vol. 1, pp. 475-76.
11. Marcuse, "Industrialization and Capitalism in the Work of Max Weber," in *Negations* (Boston, 1968), p. 225.
12. *Ibid.*, p. 212. Cf. *One-Dimensional Man* p. 144-45.
13. Habermas, "Technology and Science as 'Ideology,'" p. 84.
14. *One-Dimensional Man*, p. 154,
15. *Ibid.*, p. 158, *Ibid.*, p. 232. For more on this subject, see Andrew Feenberg, "Transition or Convergence: Communism and the Paradox of Development," in Frederick Fleron, ed., *Technology and Communist Culture*.
17. *One-Dimensional Man*, p. 166.
18. Habermas, "Technology and Science as 'Ideology,'" pp. 85-86; William Leiss, *The Domination of Nature*, pp. 211-12.
19. *One-Dimensional Man*, p. 156; cf. pp. 138, 147, 158, 168; and in Marcuse's essay on Max Weber in *Negations*, p. 215.
20. For a useful discussion of relevant issues in Weber, see, Donald McIntosh, "Max Weber as a Critical Theorist," *Theory and Society* (January 1983).
21. For more on this subject, see Andrew Feenberg, *Lukacs, Marx and the Sources of Critical Theory*, chapter 3.
22. *One-Dimensional Man*, p. 146.
23. *Ibid.*, pp. 105-106,
24. *Ibid.*, p. 157.
25. *Ibid.*, p. 168.
26. *Ibid.*, p. 166.
27. *Ibid.*, pp. 233-34.
28. *Ibid.*, p. 232.
29. *Ibid.*, p. 233,
30. For an interesting analysis of the cultural problems raised by this group, see Carmen Claudin-Urondo, *Lenin et la révolution culturelle*, pp. 47-60.
31. *One-Dimensional Man*, pp. 166-67.
32. Marcuse, *An Essay on Liberation*, p. 24. For a more detailed

account of these new forms of social practice, see Andrew Feenberg, *Lukacs, Marx and the Sources of Critical Theory*, chapter 8.

33. Marcuse, *Counterrevolution and Revolt* (Boston, 1972), p. 66.

34. *Ibid.*, pp. 67-68.



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