Chapter Twelve

The Problem of Nature in Habermas

Joel Whitebook

1996 Introduction

Written almost twenty years ago, “The Problem of Nature in Habermas”—which is being published here more or less in its original form—belongs to an earlier phase in both my own thinking and in the development of critical theory and the ecology movement. Rereading it today, though I discovered a number of stylistic points that I would have like to have changed, I was also surprised to find how sound I still consider many of its formulations. Indeed, many of the questions posed in the article continue to engage my thinking today, and the main dilemma it addressed has by no means been resolved.

“The Problem of Nature in Habermas” was my first sustained confrontation with the debate, if it can be called that, between the first and second generations of the Frankfurt School. Having broken my theoretical teeth on Marcuse in the sixties, and having gone on to devour Horkheimer and Adorno’s Dialectic of Enlightenment in the early seventies, I was grappling with the consequences of the Habermasian turn for critical theory. Although there may have been a shift of emphasis in the topics I have subsequently addressed (owing, in part, to the fact that I turned my attention to the problem of nature and became a practicing psychoanalyst along the way) the core field between Adorno’s and Habermas’s philosophy continues to animate my thinking.

This essay was, if not the first, at least one of the first articles to address systematically the ecological crisis from within critical theory. It must be recalled that in the early seventies, the ecology crisis was only beginning to
emerge in popular consciousness. Three Mile Island, Chernobyl, and the Exxon Valdez had yet to happen, and an organized movement on the scale of the Greens had yet to appear on the political scene. The connection between the ecological crisis and the old Frankfurt School was, however, not difficult to establish. Indeed, in moving the domination of nature to the center of their analysis in the forties, the early critical theorists had almost predicted it. The difficulty was, rather, to envision a possible solution on the basis of their diagnosis. Like the solution to the crisis of modernity in general—which of it was a part—the solution to the ecological crisis appeared to necessitate an eschatological rupture in history which would undo the domination of nature and establish a qualitatively new, noninstrumental relation with it. Given Horkheimer and Adorno's analysis however, such a utopian solution seemed both virtually impossible and extremely hazardous; hence their impasse and political quiescence.

I should point out that at the time I wrote "The Problem of Nature in Habermas," I was more willing to entertain the utopian gambit than I would be today. Twenty years of political history, as well as the sustained criticism of both the poststructuralists—who were also just making their appearance on the scene in the States—and the critical theorists, have changed my thinking on the subject of utopia.1

As is well known, Habermas attempted to break out of the theoretical and political impasse of the Dialectic of Enlightenment by introducing the distinction between instrumental and communicative reason. The advantages of this so-called linguistic turn were twofold: it allowed him to elucidate more successfully the theoretical and normative foundations of critical theory, and it also allowed him, as opposed to Horkheimer and Adorno, to identify certain normative advances in modernity which could provide a foothold for critique and action. Habermas was thus able to formulate a "radical liberal" program, which he came to understand as the completion of modernity's unfinished project of democratization, and which allowed him to circumvent the political paralysis of Horkheimer and Adorno.

Despite the decided advantages of this strategy, it resulted in a consequence that could be troubling to someone concerned with ecology. Habermas's basically Kantian, that is, anthropocentric, position appeared to relegate nature to the status of a meaningless object of instrumental control. Indeed, Habermas explicitly said as much and rejected the possibility, advocated by Marcuse, of a new, qualitative science in which nature would not be constituted as an object of instrumental domination. He argued that modern Galilean science provides the only valid (cognitive) relation to the natural world. Habermas thus seemed to have purchased his escape from Horkheimer's and Adorno's cul-de-sac at the price of surrendering nature to instrumental reason. At the same time, he was understandably hostile to any theoretical move that might threaten to undo the philosophical construction on which his theoretical and practical advances were based and hence trump his arguments for democracy—a: the introduction of alternative, noninstrumental conceptions of nature certainly would. Any solution to the ecology crisis that could be conceived from within his anthropocentric framework would, therefore, have to retain nature as an object instrumental objectification.2

At this point, it is necessary to introduce two new characters into my narrative, Murray Bookchin, and Hans Jonas. I had discovered Bookchin's work in 1969—during the period when SDS was in the frenzied process of cannibalizing itself—and it seemed to provide a promising alternative to the self-destruction of the New Left.3 Bookchin was probably the first figure on the Left to recognize the significance of ecology for the trajectory of capitalist development, hence for radical politics. It is remarkable indeed that he had already written about the importance of ecology in the fifties. Under his influence, it became increasingly central to my own theoretical and political perspective as well.

Similarly, Hans Jonas, with whom I studied at the New School for Social Research in the seventies, was one of the first philosophers in the academy to address not only the ecological crisis, but the whole array of novel issues introduced by the revolutions in technology, biology, and medicine. Both Bookchin and Jonas argued that the nature and enormity of the ecological crisis demanded a rethinking of the basic structure of modernity, containing as it does the domination of nature as one of its constitutive features. Philosophically, this would mean challenging the anthropocentrism of modern ethics, that is, the position which sees nature as a meaningless manifold and all value emanating from the side of the human subject. To conceive a solution to the ecology crisis, they argued, it would be necessary to conceptualize not just the good-for-humanity, from which the good-for-nature could then possibly be derived, but the good-for-nature in its own right.

"The Problem of Nature in Habermas," then, represented my attempt to think through the issues that the ecological crisis raised for critical theory by bringing the anthropocentric position, represented by Habermas, into confrontation with the anti-anthropocentric position, represented by Marcuse, Bookchin, and Jonas. As the reader will discover, however, the results were anything but conclusive. On the one hand, it seemed that nothing short of a comprehensive structural transformation of our relation to the natural world would be adequate to the character, severity, and depth of the ecological crisis. On the other hand, the possibility of conceiving such a transformation in a way that would not sacrifice the indisputable achievements of modernity—its productive capacity and advances in democratization—seemed slim indeed.

While that dilemma remains, in principle, no less acute now than it was twenty years ago, it has been ignored for the most part by recent critical theory.4 Owing to the demise of Marxism, the renewed encounter with liberal theory, and the increased defense of democracy and human rights that has resulted
from it, contemporary critical theorists have been occupied almost exclusively with fortifying their normative theory. They have had little inclination to take up an issue like the problem of nature, which might threaten the philosophical construction on which that normative theory is based. While no one can argue against the defense of democracy and human rights, this entire strategy has had a curious result: namely, that critical theory, which aspires to provide a comprehensive theory of the crisis of modernity, has little to say about one of its most decisive features, ecology. The real challenge would be to think both democracy and ecology.

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Introduction

The way Habermas has elaborated the tradition of critical theory makes his contribution difficult to evaluate. While he has undoubtedly rectified some of the most glaring theoretical defects of his predecessors, he has also markedly altered the spirit of their project. He has gained the theoretical advantages of his own position at the price of breaking with Adorno, Horkheimer, and Marcuse on fundamental issues. This does not mean that these theoretical advances could have been achieved in a different manner, nor that the spirit of the early Frankfurt School ought to be preserved. It means that Habermas's theory 33 differs from that of his predecessors as to seriously raise the question of continuity. 5

Two standard criticisms are usually raised against the early Frankfurt School: (1) their pessimism could only lead to resignation, and (2) the foundations of critical theory were never clarified so that the resulting critique of society was itself never grounded. With respect to both these problems, Habermas's theory represents an advance. As for the first point, Habermas argues that the pessimism of the early Frankfurt School was not simply the result of a sober examination of historical forces, but, insofar as it resulted from tacit (and incorrect) theoretical presuppositions, was presumed at the outset. Concerning the second point, Habermas develops a transcendental argument to provide the epistemological and normative foundations for critical theory. It is here that his theoretical advances often result in blunting the thrust of the early critical theorists' vision. Given their analysis, a solution to the historical impasse of our time—however unlikely—requires reconciliation with nature.

"The Problem of Nature in Habermas" was first published in Telos 40 (Summer 1979): 41–94; reprinted by permission, with minor corrections.

While providing a superior theoretical grounding for critical theory, Habermas's transcendentalism necessarily precludes any reconciliation with nature. Theoretical rigor is obtained at the expense of the original utopian ideal.

The Impasse of the Frankfurt School

During its exile, the Frankfurt School sought to comprehend the new and deeply disturbing world situation. They located the cause of disparate phenomena such as European fascism and the American culture industry in the same underlying historical tendency: that is, the Enlightenment. While the Enlightenment's goal of improving "man's estate" through the progressive replacement of myth by reason and the conquest of nature may be laudable, its strategy is flawed: the domination of outer nature necessitates the domination of inner nature, that is, the recycling of man's instinctual organization so that he becomes capable of exercising the type of renunciation necessary for the transformation of external nature: "The subjective spirit which cancels the animation of nature can master a despiritualized nature only by initiating its rigidity and despiritualizing itself in turn." 6 This thesis explained the re-emergence of barbarism and was the source of the early Frankfurt School's pessimism.

By the middle of this century, the goal for which the domination of nature had been undertaken, the creation of the material precondition for a free society, so it was assumed, was being achieved. But, because of the conceit that reification of the "subjective spirit," those preconditions could not result in a more humane social order. Generalizing from this, it was argued that: the attempt to create a free society was inevitably a self-destroying enterprise. "To the extent that the material preconditions for a free society have been created, the subjective conditions necessary for its realization will have been distorted.

Given this analysis, the pessimism of the early critical theorists can be challenged in several ways. One, and by far the most difficult option, consists in trying to make plausible a nonregressive reconciliation with nature. In fact, this seems to be the only way out as long as one accepts their main thesis. It entails developing a new mediation between society and the natural world, for example, a "new science" that does not approach nature as a purposeless object of domination. This process of reconciliation would have to be nonregressive in two senses. First, it would have to avoid slipping back into pragnation, for example, mythical, forms of thought. Second, it could not regress behind the present level of technical proficiency or else one of the conditions of a satisfactory solution, the material prerequisites for a new society, would no longer obtain. Adorno and Horkheimer accepted these conditions for a satisfactory solution to the "riddle of history," but were skeptical about the possibility of their fulfillment. Marcuse, on the other hand, has hinted at the possibility of such a utopian solution by means of a "qualitative physics" and a new
sensibility. Unfortunately, his discussion has never gone beyond mere suggestions and he has not grappled with the ensuing difficulties.\(^6\)

A second alternative would be to challenge the main thesis. This is the strategy followed by Habermas. Thus, the basic error of the earlier critical theorists was that their philosophy was (at least implicitly) monistic.\(^7\) According to Habermas, while there is an intimate connection between the domination of eternal and internal nature, the two processes do not follow the same logic. Horkheimer's and Adorno's failure to differentiate satisfactorily between the two led to their fateful impasse. To correct this situation and to avoid those mistakes, Habermas introduces his dualistic framework: while the logic of instrumental rationality governs the domination of external nature, the logic of communicative rationality governs that of internal nature.

The most notable difference between the two logics is that, whereas the former aims at reification, for the second, reification is a possible but pathological outcome. The domination of external nature aims at the reification of the object in order to render it susceptible to instrumental manipulation. Taking modern science as its most refined example, instrumental rationality can in principle be reconstructed as a formal, deductive system. This degree of formal rigor can be achieved because science abstracts from the existing intersubjective communication in scientific practice, and can thereby methodologically bracket the ambiguities inherent in ordinary language communication. Karl-Otto Apel attempts to criticize science precisely by returning to this suppressed dimension of "the a priori of communication" underlying science.\(^10\)

Instead of the application of technical rules to heterogeneous objects, the appropriation of internal nature involves the transformation of drives through the internalization of intersubjective norms. The proper telos of this process is not reification, but autonomy, individuation, and socialization, which means the ability to maintain one's identity by simultaneously identifying with and differentiating oneself from other subjects in a social, that is, communicative, context. Reification—for example, the rigid compulsions of a neurotic—is a possible outcome of this process, but in this case it is a pathological rather than the desired one. As it moves in irreducibly plural, that is, "dialogical," milieu of ordinary communication, communicative rationality can never attain the same degree of formalization as instrumental rationality.

Because they fail to differentiate sufficiently between the domination of inner and outer nature, Horkheimer and Adorno do not have the conceptual resources necessary to formulate an adequate notion of an emancipated self. Or, to put it differently, were they confronted with the emancipated self presupposed by their argument, they would have to disavow it. Horkheimer and Adorno, of course, know that the self is formed through the domination of inner nature and that prior to its achieving a degree of instinctual mastery it does not make sense to speak of a self: "man's mastery of himself...grounds his selfhood." However, since they conceive of the domination of inner nature on the model of instrumental rationality, the telos of which is reification, all self-formation must be equivalent to reification. Given their argument, a nonreified self is a logical impossibility.

Not only do they fail to formulate a positive notion of the self, but insofar as it imposes its tyrannical unity on the manifold of instinctual contents, Horkheimer and Adorno tend to view the self as the "enemy": "Men had to do fearful things to themselves before the self, the identical, purposing, and virile nature of man was formed and something of that recurs in every childhood. The strain of holding the I together adheres to the I in all ages: and the temptation to lose it has always been there with the blind determination to maintain it."\(^11\) As the self per se is taken as the agent of repression, it can no longer be what is to be emancipated. Instead, what is to be emancipated becomes the repressed inner nature, which is tyrannized by the self. It can be granted that the self will be impoverished and rigidified to the extent that it denies its inner nature, and that an emancipated self will have reconciled itself with its own natural substrate. Nevertheless, emancipation is something that is undertaken for the sake of the self, and not for the sake of our biological endowment, as Horkheimer and Adorno imply.

Because he loosens the connection between the domination of internal and external nature and grants a degree of relative autonomy to the communicative level, Habermas can conceptualize moral progress. Whereas for Horkheimer and Adorno, technical progress necessarily entails moral regression, Habermas can envision simultaneous progress on both levels. Unfortunately, his conception of progress leaves much to be desired from the viewpoint of those, who retain some identification with the old Frankfurt School. The problem revolves around the question of disenchantment. The New Left and the counterculture of the 1960s more or less self-consciously sought the basic reenchantment of the world in a variety of forms,\(^12\) and while he does not thematize this point, Habermas is a thoroughgoing disenchanter. In this respect, he differs considerably from his predecessors. He counsels an end to utopian excesses, a recognition of the progressive features of modernity and the attempt to achieve a just and rational society from within the modern Weltbild. Indeed, an emancipated society for Habermas consists in the completion, and not the transfiguration, of the modern project.

**Habermas's Reformulation of Critical Theory**

The theoretical advances of Habermas's position and his doctrine of nature stem from the same source, namely, his transcendentalism—or "quasi-transcendentalism," as he calls it. Through reflection on the evolution of the species, Habermas claims to have determined the categorical frameworks—instrumental and communicative—within which the basic modes of human
knowledge and action develop. He then employs those categorical distinctions to elucidate the heretofore unclarified foundations and status of critique. While Habermas’s account grounds critical theory with an increased theoretical rigor, it also condemns nature to being exclusively an object of domination. A consequence of his analysis is that nature can only be known as an object of possible technical control.

Habermas’s transcendentalism can best be understood by comparing it with Kant’s, the classical prototype of transcendental theorizing. While both share a similar desideratum, the means by which they seek it differ significantly. The feature that most distinguishes Habermas’s transcendentalism from Kant’s is that, whereas Kant’s transcendental subject is singular, Habermas’s is plural. Kant sought to determine the conditions of the possibility of objects and knowledge of experience through an investigation of the synthetic acts of a transcendental consciousness. To achieve the same end, Habermas examines the a priori interest structures that inform the dimensions within which the human species evolves and which also govern the various forms of human knowing and acting. And, inasmuch as modes of scientific activity have been differentiated in the course of evolution which represent methodologically rigorous means of pursuing these interests, transcendental reflection can also proceed through an examination of the methodological a priori of the various scientific domains. “I do not assume the synthetic achievements of an intellectual ego nor in general a productive subjectivity. But I do presuppose, as does Peirce, the real interrelationship of communicating investigators, where each of these subsystems is part of the surrounding social systems, which in turn are the result of the sociocultural evolution of the human race.”

The unity of Habermas’s plural, transcendental subject can be clarified by considering the conditions of the emergence of the human species. At some point in time, and strictly in accordance with the laws governing the evolution of prehuman nature, a unique event occurred, namely, the emergence of man as a zoom logikon. With that event, a qualitatively new type of law, the law governing logos, was introduced into the course of what had thereby become sociohistorical evolution. Man’s lack of a specialized instinctual endowment and the resulting period of extended dependency and maturation made the use of language for communication both possible and necessary for the species. Is it not plausible, as Habermas maintains, that the laws which were introduced into the course of evolution with the emergence of man as the zoom logikon, and which constitute conditions of the possibility of human association, also constitute the fundamental norms of that association? “The human interest in autonomy and responsibility is not mere fancy, for it can be apprehended a priori. What raises us out of nature is the only thing whose nature we can know: language. Through its structure, autonomy, and responsibility are posited for us. Our first sentence express unequivocally the intention of universal and unconstrained consensus.” We can see in this passage the convergence of Habermas’s epistemological and normative concerns. For transcendental investigation reveals not only conditions of the possibility of the evolution of the species, but also the norms that Habermas employs as the basis of his communicational ethics.

While the norms of human communication and association are “posed” with the first sentence, they need not be realized in any given empirical instance of communication nor in any given language game. The point is that they are counterfactually presupposed in all communication in that tacit reference must be made to them for communication to take place. Indeed, even the ability to violate them, as in the case of lying, presupposes their existence. Regarding the unity of Habermas’s plural subject of thought and action, it is transcendently unified and empirically diverse. With respect to the conditions of the possibility and anticipated goal of evolution, the subject is unitary. But that presupposed and anticipated unity may be more or less of an actuality at any point in empirical history.

Habermas thus holds that Hegel is correct against Kant in maintaining that, with respect to the realm of history, and as opposed to the realm of nature, it is impossible to locate unambiguously a transcendental subject outside of history, who stands over the object it constitutes. Instead, the genesis of the transcendental subject occurs in the very realm that comprises its object domain, that is, the realm of history. An examination of human evolution from the perspective of language is the only type of theory, so it is argued, that is adequate to the “peculiar relation between subjectivity and intersubjectivity between the ‘transcendental’ and the ‘empirical.’” Inasmuch as it can be simultaneously its own metalanguage, ordinary language is the only phenomenon available to us which contains at the same time an empirical and a transcendental moment.

But if Hegel is correct in his move from a philosophy of consciousness to a philosophy of spirit (which Habermas interprets linguistically), Marx, in turn, is right, against Hegel’s idealism, in insisting that “nature is the absolute ground of mind”: “The seal placed on absolute knowledge by the philosophy of identity is broken if the externality of nature, both objective environmental and subjective bodily nature, not only seems external to a consciousness that finds itself within nature but refers instead to the immediacy of a substratum on which the mind contingently depends.” To be sure, Habermas must “reconstruct” Marx, by bringing out the latent transcendentalism in Marx’s own position, in order that Marx’s materialism does not degenerate into a bad objectivism. Yet, Habermas’s modification of the traditional transcendental project follows from his basic acceptance of Marx’s materialistic critique of philosophy.

For Habermas, after Hegel’s last heroic effort, and Marx’s critique of Hegel, it has become apparent that philosophy cannot fulfill its traditional ambition of, as it were, getting behind reason’s back and securing its own foundations.
Philosophy, in short, can no longer be practiced as a “philosophy of origins” (Ursprungsphilosophie). Habermas is quite willing to accept a degree of “unavoidable circularity” with respect to foundational questions, and simply attributes this to the finitude, that is, the material groundedness, of the human mind. Despite the impossibility of ultimate foundations, Habermas is nevertheless satisfied that, in the course of evolution, mental structures developed which—owing to their having emerged through a process of natural selection—someday “fit” the world. The task of theory is not to deduce the validity of those structures in a way that would require an ultimate standpoint, but to explicate that “fit.”

Yet, if Habermas’s transcendental claims are not philosophical strict sense what is their exact status and how does he arrive at them? This is where we encounter the unique terrain of critical theory, as Habermas conceives it, which lies somewhere “between philosophy and science”. “Representations and descriptions are never independent of standards. And the choice of those standards is based on attitudes that require critical consideration by means of arguments, because they cannot be either logically deduced or empirically demonstrated. Fundamental methodological decisions, for example such basic distinctions as those between categorical and noncategorical being, between analytic and synthetic statements, or between descriptive and emotive meaning, have the singular character of being neither arbitrary nor compelling. They prove appropriate or inappropriate. For their criterion is that the metalevel necessity of interests, that we cannot neither prescribe nor represent, but with which we must come to terms. Therefore my . . . thesis is this—the achievements of the transcendental subject have their basis in the natural history of the species.”

Habermas seems concerned to avoid two equally unacceptable alternatives. He does not want to assert that the validity of fundamental norms can be demonstrated with the rigor sought by “traditional theory.” Yet, he is equally opposed to the skeptical contention that these concepts are arbitrary, in the sense of either being the mere products of convention or of biological adaptation in any simple sense. While the validity of these principles may not be demonstrable in a completely compelling fashion, there are nevertheless “good reasons” for their acceptance.

To the extent that these transcendental structures “have their basis in the natural history of the species,” they possess a certain facticity and can be examined through empirical anthropology. If, however, these transcendental structures were only the products of evolution, then a naturalistic interpretation of reason—with its inescapable skepticism—would be unavoidable. Reason would simply be an “organ of adaptation for men just as claws and teeth are for animals,” and no claims for its autonomy could be made. Habermas argues that, although reason has its genesis in natural evolution, at some point in that process, reason transcends the conditions of its genesis and achieves a degree of autonomy.

Methodologically, the theory that elucidates and justifies the transcendental interest structures within which the species develops, although it contains an empirical moment, cannot simply be an empirical theory. The employment of a strictly empirical theory for the purposes of an “anthropology of knowledge” would involve a logical dilemma. For empirical anthropology is a “founded science,” which is itself constituted within “the framework of the objectifying sciences,” and cannot therefore be used as a “founding science” to establish that framework. This dilemma has its origins in the fact that the knowing subject, which constitutes nature as an object of knowledge, is itself a product of nature. In other words, the difficulty arises from the fact that the constituted constitutes the constitutant. An anthropology of knowledge, if it is to avoid a vicious circle, cannot simply be an empirical theory, but must contain a “reflective” moment as well.

To account for this state of affairs, Habermas makes a threefold distinction between objective nature, subjective nature, and nature in itself (natura naturans). Nature in itself can be further differentiated into (evolutionarily) prehuman nature and something similar to the Kantian Ding-an-sich. Thus, prehuman nature produces the human species in the course of natural evolution, and that created species possesses a subjective nature which constitutes objective nature as an object of possible experience and knowledge. The particular makeup of the species is such, according to Habermas, that objective nature is constituted as an object of possible technical control. Furthermore, knowledge of objective nature is, in a Kantian fashion, knowledge of a system of appearances, and something like a Ding-an-sich must be posited as lying behind our apprehension of objective nature. Unlike the Kantian Ding-an-sich, however, Habermas’s is not a quasi-object affecting our receptive apparatus. Rather, it is simply a theoretical postulate which must be made to indicate the externality, contingency, and facticity of nature which conspire to confound any arbitrary interpretations we seek to impose on it.

Habermas must posit the existence of a prehuman nature and a Ding-an-sich to take account of the fact that, as McCarthy puts it, “cognition appears to be bound on both sides by contingent conditions.” Leaving aside the question of the Ding-an-sich, a serious difficulty intrinsic to Habermas’s attempt to synthesize materialism and transcendentalism arises concerning prehuman nature. Does the “materialist” claim that prehuman nature produces subjective nature, as McCarthy asks, not throw Habermas back into a precritical ontology that violates his transcendental posture? The question reemerges at the level of the philosophy of biology, where Habermas needs to, but cannot, account for the transition from prehuman to human nature. In both cases, he wants to say more than can legitimately be said from within the confines of his position.

The terrain that Habermas wants to stake out for his transcendental-foundation discourse thus lies somewhere between empirical science and first philosophy. He wants to oppose the objectivistic misconception of the sciences through reflection
on the conditions of the possibility of the various sciences. He does not, however, want to have to move to the topes of traditional first philosophy, with all of its attendant dilemmas. But can this middle ground be maintained? This, in turn, rests on the successful differentiation between empirical and transcendental anthropology. The following question, however, can be asked of any given empirical theory, for example: Gehlen's, that Habermas might employ for transcendental-foundation purposes: By what right does it gain its transcendental status? The claim is, of course, that in the course of anthropological research certain "reflexively traceable" rules have been discovered that function as transcendental frameworks within which the different modes of thought and action are constituted. With our sensitivity to historicist concerns, however, we want to inquire into the status of those theories that claim to have discovered the invariant features of human history. Are they not themselves historically specific, fallible theories that can be superseded at any time?

To put the question in more explicitly Hegelian terms, we can ask Habermas the question Hegel posed to Kant: What are the conditions of the possibility of discovering the conditions of the possibility of knowledge? Habermas's criticism of the objectivist understanding of science is that objectivism dogmatically assumes the validity of first-order scientific knowledge without reflecting on the presuppositions of that knowledge. However, we can ask Habermas, in turn, why reflection should stop at the level of transcendental anthropology and not proceed further? More traditional transcendental philosophers at least claim to carry reflection to a point where it becomes theorectically self-evident that a terminus has been reached. Indeed, the presence of such a terminal point for reflection can be taken as a hallmark of transcendental philosophy in the strict sense. In light of this consideration, does Habermas's failure to carry reflection beyond the level of transcendental anthropology, which certainly does not contain a self-evident point of termination, not constitute an objectivism of the second order—a transcendental objectivism as it were? In short, is Habermas himself not guilty of "arbitrarily arresting reflection?"

Habermas would doubtless answer—and here his acceptance of the Marxian critique of the limits of philosophy is fully visible—that the questions presuppose that the traditional ambitions of first philosophy can be fulfilled, a presupposition that we have seen he denies. If we are seeking the sort of theoretical satisfaction promised by "traditional theory," Habermas admits he cannot provide it. It must be understood that, if philosophy is taken as that mode of theorizing that adheres to the standards of rigor that Habermas says cannot be met, then his claims about the unrealizability of those standards must in some sense be "extraphilosophical"; one cannot offer a strict philosophical proof of the impossibility of philosophy. The status of Habermas's claims concerning the impossibility of first philosophy self-avowedly suffers from the same limitations as what they assert.

For Habermas, "coming to terms" with the transcendental standpoint—a phrase with almost therapeutic overtones—means that, while the epistemological and transcendental grounding of the sciences cannot be accomplished with the rigor traditional philosophy sought, they can nevertheless be accomplished in some sense. If Hegel is correct about the aporetic character of the Erkennteisproblem, "then the critique of knowledge can no longer claim to fulfill the intention of First Philosophy. But it is not at all clear why abandoning this should entail abandoning the critique of knowledge itself." With Wittgenstein, Habermas shares the "therapeutic" intention of disabusing us of the wish for a fully satisfying first philosophy. Against Wittgenstein, however, Habermas does not wish to embrace the skeptical consequences of either remaining silent about the most important question or accepting a plurality of incommensurable language games. Habermas's point is, rather, that a self-consciously less ambitious, quasi-transcendental grounding provides us with plausible, if not completely compelling, foundations for our knowledge. And while this type of theorizing may not offer the satisfaction held out by first philosophy, it does nonetheless avoid the despair of skepticism.

To "come to terms" with the transcendental standpoint is to see the essential rightness of this position and the "impossibility of getting beyond these transcendental limits." It is somewhat ironic, however, that Habermas, who is often accused of hyperrealism by the hermeneuticists, requires so large an element of judgment at the very base of his scheme. The way in which one "comes to terms" with the transcendental standpoint ultimately bears a closer resemblance to aesthetic sense or Aristotelian phronesis than to emphatic philosophical proof. While Habermas's transcendental scheme is meant to serve a theoretical function of grounding our knowledge, which is analogous to traditional Ursprungsphilosophie, the scheme itself is not grounded in as emphatic a fashion as one generally finds in first philosophy.

Some Difficulties with Habermas's Position

The practical implications of Habermas's philosophical scheme become clear in his colleague Apef's article on "The Conflicts of Our Time and the Problem of Political Ethics." Apef explicitly locates his concerns in the context of the planetary ecology crisis and inquires into the prospect of a "philosophically grounded political ethics" that is adequate to that crisis. The major difficulty that such an ethics must confront results from the unprecedented power and global expansion of modern science and technology. A dilemma occurs in that at the same time as the global effects of modern science and technology make political ethics more necessary than ever, the hypothesis of scientific rationality as the only valid mode of rationality, that is, scientism, appears to preclude the formation of such an ethics. Consequently,
the desideratum for communications theory is to dissolve the blockage to rational ethics caused by the hypostatization of scientific rationality and the formulation of a positive doctrine of ethics.

While their particular theories differ in some details, Apel and Habermas agree that a transcendental critique of the pragmatic dimension of language can accomplish both these tasks simultaneously. With respect to the dehypostatization of scientific rationality, such a critique demonstrates that the language of science, as a specialized form of language, presupposes the general structures of communication as such. The argument is that scientific rationality is not the ultimate form of rationality, but is a specialized language game abstracted out of ordinary language and, as such, presupposes a more fundamental form of rationality embedded in ordinary language. Unlike the romantic attack on science, the point is not to disparage the achievements of science, but to criticize scientism, that is, the grandiloquent claims made for the specialized form of rationality embodied in modern science.

The same critique which removes the obstacles to a rational ethics also indicates what direction a positive doctrine of ethics should take. Not only is scientific rationality derivative from and bound by a more fundamental form of communicative rationality, but communicative rationality also has a normative dimension within it which can become the basis for an ethical doctrine. It can be shown, so the argument goes, that the conditions of the possibility of communication are, in part, normative. The individual’s ability to use language, that is, “communicative competence,” presupposes the existence of certain norms that need not be realized in any given act of communication. In language, Apel and Habermas claim to have located that sui generis phenomenon which, while factually given, nonetheless has a normative dimension. Thus, it is the only realm where the problem of the “is” and “ought” can be overcome. Communicative ethics promises to eliminate the impasse of recent ethical theory by removing the scientific obstruction to normative theory and by locating language as the field where the fact-value problem can be resolved.

Although communicative ethics may hold promise for overcoming scientific impediments to normative theory and for formulating positive ethical doctrines in certain contexts, its adequacy to the unprecedented ethical problems raised by the ecology crisis remains questionable. This is due to the fact that, to use the terminology of traditional ethical theory, communicative ethics is thoroughly anthropocentric. As opposed to all forms of naturalistic, ethics anthropocentrism holds that man is the only locus of value and the only being that commands respect in the universe. Communicative ethics represents a variation on the anthropocentric theme in that it maintains that man, by virtue of his communicative capacity, is the only value bearing being that can be identified. Thus, communicative ethics, as a form of anthropocentrism, rules out any conception of nature as an “end-in-itself.” This is to be expected. Habermas’s transcendental stance prevents the sort of direct access to nature that would make any claim for nature as an end-in-itself possible. As with Kant, theoretical transcendentalism and ethical anthropocentrism go hand in hand.

In addition to his acceptance of modern science and modern philosophy’s focus on subjectivity, there are good reasons why Habermas and most contemporary philosophers want to exclude the idea of nature as an end-in-itself from ethical theory. The dignity and rights of the moral and legal subject have been secured by severing the subject from the realm of natural existence. Because they are characterized by self-consciousness or language, subjects are considered qualitatively different from the rest of natural existence. This is why they command respect and ought to be treated as ends-in-themselves. It is often feared that anything that threatens to disturb this distinction—which the concept of nature as an end-in-itself certainly does—also threatens the dignity of the subject.

However, the dignity of the subject—the discovery of which, as Hegel continually stresses, is one of the momentous achievements of modern philosophy—is attained at the price of denying all worth to nature. Habermas appears willing to accept this arrangement. Given the main thrust of his philosophy, Habermas would be unwilling to tamper with the constellation on which the dignity of the subject has traditionally rested, even for so grave an issue as the ecology crisis. Whatever solution he formulates must leave that constellation intact. For a variety of reasons—for example, his adherence to the basic posture of modern philosophy; his desire to “save the subject” from the multiple threats of vulgar Marxism, mainstream scientism, and the monism of the early Frankfurther School; his suspicion of Naturphilosophie owing to the pernicious role it has played in German intellectual history; and so forth—Habermas is unwilling to entertain the concept of nature as an end-in-itself, regardless of how tempting it might be for an ecological ethics. The “good-for-nature” must somehow be derived from the “good-for-man.”

While no one would want to violate the dignity of the subject, the following question must nevertheless be raised: Can we continue to deny all worth to nature and treat it as a mere means without destroying the natural preconditions for the existence of subjects? Likewise, can the worth of nature be secured without devaluing the dignity of the subject? Hans Jonas has argued that the gravity of the ecology crisis and the fact that the biosphere “has become a human trust” require a rethinking of the “givens” of modern philosophy so that nature will no longer be condemned to being a mere object. And from within the critical theory camp itself, Apel has argued similarly that the “unchecked onslaught of technology upon nature [which] threatens to destroy the life space of all living creatures” should prompt a reconsideration of the “objective-teleological conceptions” that were denigrated with the “triumph of mechanistic thought.” Unfortunately, Apel does not pursue this line of thought far enough. If he did, it would produce serious difficulties for his and Habermas’s scheme of cognitive interests and their communicative (i.e., anthropocentric) approach to ethics.
Several of the consequences that followed from Kant's transcendentalism also appear to follow from Habermas's: a dialectics or philosophy of nature becomes impossible and nature can only be validly apprehended as an object of the natural sciences.

Kant's "Copernican Revolution" is seen by the proponents of transcendental philosophy as having established inviolable standards for philosophizing. Among the central components of this "revolution" is the insight that, due to the fact that the a priori structures of knowing constitute the objects of knowledge, our access to those objects is necessarily oblique. Any theory that does not take this obliqueness sufficiently into consideration and does not deal adequately with the constitutional moment of knowing in its philosophical construction is theoretically naive. A "dialectics of nature" that purports to know the movement of nature in itself, independently of the a priori structures of knowing, makes precisely the sort of claim to direct access to the "othersidedness" of nature which the transcendental turn rules out. From the standpoint of transcendental philosophy, a "dialectics of nature" is theoretically naive.\(^\text{39}\)

Moreover, for both Kant and Habermas, the knowledge that can be validly claimed of nature within the framework of transcendental philosophy is the type of knowledge contained in modern science, that is, knowledge of nature as a thoroughgoing mathematical manifold, devoid of meaning, value, and purpose. Although Kant himself does not lay great stress on the utilitarian possibilities of a mathematized science, Habermas argues that nature thus constituted is essentially an object of possible technical control. This, however, concerns the constitutional features of modern science, and not the subjective motives of the practicing scientist. However gratuitous the intentions of any given scientist may be, Galilean science is—by virtue of its mathematical character, nomological form, experimental method, and so forth—constitutionally instrumental and at least potentially technological. While it would be mistaken to make too immediate an identification between Galilean science and modern technology, it is nevertheless the case that the technological revolution was one of the innermost possibilities of a mathematized science.

Habermas does not shy away from the consequences of his position: "The resurrection of nature cannot be logically conceived within materialism, no matter how much the early Marx and the speculative minds in the Marxist tradition (Walter Benjamin, Ernst Bloch, Herbert Marcuse, Theodor W. Adorno) find themselves attracted by this heritage of mysticism."\(^\text{40}\) The "resurrection of nature" refers to the transformation of our relation to and knowledge of nature such that nature would once again be taken as purposeful, meaningful, or as possessing value. It would mean the undoing of the determinologicalization of nature that occurred with the rise of Galilean science. Just as Habermas believes the ethical and legal principles of modernity are somehow "timeless," he also believes that there is something unsurpassable about modern mathematical science.

For Habermas our relation to nature, insofar as nature is taken as an object of cognition, can only be one of instrumental control. This is not a contingent fact over which we might exert any influence. On the contrary, it derives from the invariant features of our anthropological endowment, which constitutes nature as an object of possible experience. Modern science and technology represent humanity's most refined and sophisticated means of pursuing its interest in instrumental control—an interest rooted in the makeup of the species.\(^\text{41}\) If this argument is correct, then a qualitatively new relation to the natural world, and a new science corresponding to it, such as Marcuse envisages, are indeed impossible.

Two strategies can be adopted to challenge Habermas on this claim: (1) I have tried to show where Habermas's transcendental scheme, on which this objectification of nature rests, is vulnerable. The point is to question the thesis that an insurpassable instrumental relation to nature is rooted in our species endowments and is therefore inevitable. (2) Habermas's claims can also be questioned with respect to the philosophy of science. While he does not seek to provide us with a detailed philosophy of science, his theory of research-guiding interests purports to delineate the various domains of scientific research and the constitutive principles operative therein. If it could be shown then that a particular branch of scientific practice could not be accounted for satisfactorily by Habermas's theory—that the principles presupposed by that science contradicted his transcendental scheme—then that branch would constitute an anomaly for Habermas's philosophy of science. Biology may very well constitute one such anomaly.\(^\text{42}\)

**Biology as a Possible Anomaly for the Habermasian Position**

It should be recalled that Galilean science is as much a program for the "mathematical march of mind" through the universe as it is a completed project. And this march has proceeded much further in the realm of inanimate matter than in the realm of vital phenomena, where some of the most elementary steps have yet to be taken. One may ask whether this is a contingent state of affairs that awaits a "Newton of a blade of grass," or whether there are good reasons to believe that the program cannot be executed. Or, one might make the stronger assertion that even if life had been exhaustively treated in mechanistic terms, it would not have thereby been explained, but explained away. Just as an explanation of mind in terms of the brain would be an explanation of mind in terms of nonmind, so an explanation of life in terms of mechanism would be an explanation of life in terms of nonlife.

Proceeding through an examination of biology is the most fruitful way to criticize Habermas on these matters and has decided advantages over other
approaches. Unlike Marcuse's, for example, this approach is not forced to confront the imponderable task of creating an "alternative science" ex nihilo. Furthermore, it involves exploring an avenue that remains immanent to modern science. By beginning from a position immanent to science, this approach would at least be in no immediate danger of contradicting the current standards of intersubjective rationality.

The surrender of nature to the domain of instrumental reason is even more thoroughgoing in Habermas than in Kant, who at least evidenced some uneasiness with the "mechanization of the world picture" and wrote the third critique as a result. Curiously enough, Kantian as Habermas is, there is no analogue to the Critique of Judgment in his opus; it is as though he perceives no pressing problem.

Kant, it will be recalled, was faced with the following dilemma: after having demonstrated that nature, as an object of possible experience, was a causal nexus through and through and therefore contained no room for purposefulness, he had to account for the seemingly teleological phenomena that confronted the scientist in his investigation of nature. Prominent among these was, of course, the apparent purposefulness of "organized beings," that is, living things. Kant's solution was to introduce the distinction between "determinant" and "reflective" judgments. Owing to the nature of the human mind, purposefulness has to be assumed, as a heuristic, in the investigation of vital phenomena. The concept of purposefulness cannot, however, appear in satisfactory scientific theories in their final form, but has to be jettisoned along the way. The concept pertains, in other words, to the logic of discovery and not to the logic of validation. Whatever one makes of Kant's critique of teleological judgment—and it is a highly perplexing theory indeed— the fact remains that he attempts to account for the apparent purposefulness that manifests itself at the subhuman level.

The questions examined by Kant concerning the nature of living phenomena were again taken up by the vitalists at the end of the last century and have come down to us in the contemporary controversies over the role of systems theory in biology. The vitalists maintained that there is an "extra something," a vital element, in living things which make them in principle not susceptible to an exhaustive treatment in mechanistic terms. Against this contention, the mechanists argued that, as this vital element has never been observed, it is a "metaphysical" post which deserves no place in modern science. The assumption of a vital principle, they further argued, is unnecessary for biological research and, given sufficient time, an exhaustive treatment of life in purely mechanistic terms will be forthcoming. The claims of contemporary reductionists are, for the most part, of a programmatic nature, and, to date, biology remains largely an autonomous science: "Indeed, no serious student, reductionist, or antireductionist, questions the truth of this [i.e., that major biological theories have yet to be reduced] and that biology remains at present an autonomous science is not a matter of dispute." The interesting question for the philosophy of biology is whether there is good reason to believe the reduction can in fact be accomplished.

A major focus of the current debate concerning reductionism is the adoption of systems theory by biologists in recent years. There can be no question as to the impact of systems-theoretical approaches on contemporary biology. However, while there can be no questions concerning the advantages gained by the adoption of systems theory for biological research, how to interpret the philosophical significance of this development remains controversial. The controversy revolves around the status of systems theory as a mode of rationality. Three basic positions are discernable in the debate:

(1) The first position, which is the most prevalent among neoe empiricist philosophers of science, holds that systems theory at last provokes the sophisticated methodology required to complete the reductionist program and the incorporation of biology into a unified physicochemical science. In this case, no claims are made for systems theory as a unique mode of rationality, but it is simply viewed as a sophisticated form of mathematical-functional analysis. The sophistication of systems theory, it is argued, is equal to the complexity of those phenomena—for example, organismic, teleological, self-organizing, and so forth—which were formerly held to uniquely characterize life and to be resistant to exhaustive analysis on mechanistic assumptions alone.

(2) The second position, which is espoused by the more enthusiastic systems theorists, is that systems theory represents a third viewpoint that can overcome the old opposition between vitalism and mechanism. It is maintained that systems theory can account for the same "vital" phenomena which vitalism sought to explain, but, in accordance with mechanism, it does not have to appeal to any "metaphysical" or "mystical" entities. In contrast to the first position, it should be stressed that—while it may be a physical theory—systems theorists do not consider their theory as either mechanistic or reductionistic. On the contrary, as an emergentist theory of hierarchical wholes, systems theory is considered an alternative to both reductionism and mechanism. To use the language of critical theory, it is considered an alternative to instrumental reason. Whereas the first position maintained that systems theory could be employed to reduce biology to physics and chemistry, here biology's employment of systems theory is adduced as evidence for the autonomy of the biological sciences.

(3) The third position, which harks back to the older Naturphilosophie, is the most speculative of the three and the least fashionable today. While it admits that vital phenomena may be amenable to a systems-theoretical treatment, it maintains that such treatment cannot do complete justice to living things; after systems theory has, as it were, cast its theoretical net, certain distinctive features of life, so the argument goes, will remain beyond its theoretical reach. It is argued that systems theory remains within the framework
of Galilean science insofar as it accepts the constitution of nature as a mathematical manifold. Indeed, instead of presenting some sort of transcendence of Galilean science as proponents of the second position often contend, systems theory, by virtue of its increased mathematical sophistication, simply represents its most sophisticated refinement to date. The argument is that essential attributes of life cannot be adequately apprehended in spatiotemporal terms alone, and that life already represents an anomaly for nature conceived of as only in extenso. Thus, Jonas argues that, although living things can be treated in purely external terms—as objects among objects—they must also be understood from the inside. Essential attributes of vital phenomena elude a purely external approach: living form cannot be reduced to cybernetic information, inwardsness cannot be understood as spatial interiority, and concern for existence cannot be explained in terms of self-regulating systems. Moreover, Jonas maintains that it is only because we are “peepholes into the inwardsness of substance,” and can know ourselves from the inside, that we can understand biological phenomena on analogy to our own experience as living beings. The proper understanding of biological phenomena, in other words, presupposes a certain communality of life.

Returning to Habermas, if the entire realm of human cognition can be exhaustively subdivided, as he claims, in terms of the three knowledge-constitutive interests—instrumental, communicative, and emancipatory—then our question becomes: where are the biological sciences to be located within his scheme? We know that Habermas emphatically denies the possibility of conceptualizing nature—presumably including living nature—under the categories of communicative rationality: “Nature does not conform to the categories under which the subject can conform to the understanding of another subject on the basis of reciprocal recognition under the categories that are binding on both of them.” If the only two possible alternatives available in this case are communicative and instrumental rationality, and if the domain of communicative rationality is exclusively reserved for speaking subjects, then it follows that the biological sciences must be assigned to the domain of instrumental rationality. Our only possible cognitive relation to other living beings in this scheme is one transcendently oriented to technical domination. Moreover, it must be assumed that, in order to preserve his scheme of cognitive interests, Habermas would have to subscribe to the reductionist program for biology—a position which is problematic on both empirical and theoretical grounds. He would have to maintain that, through the application of systems theory, the apparently teleological features of living things could be accounted for, and biology thereby fully incorporated into a unified physical theory—that is, into instrumental reason. And, the claims of the more naive systems theorists notwithstanding, it is obvious from his discussions with Luhmann that Habermas has no illusions about the “noninstrumental” character of systems theory.

Habermas thus divides the scala naturae—albeit from the side of epistemology and methodology—at the level of human intentionality or communicability. While everything on the subhuman level, including life, is assigned to the realm of instrumental reason, the domain of human communicability remains the last preserve in an otherwise mechanized universe. Habermas is, in short, an antireductionist for the human sciences and a reductionist for the life sciences. He is not basically in disagreement with the neoepistemist program for a unified science as long as that program is contained to the realm of nonspeaking nature and is interpreted in transcendental-instrumental rather than a realistic fashion. Today there is nothing particularly unusual about this stance. On the contrary, it is more or less the strategy adopted by most contemporary antipositivist philosophers, for example, phenomenologists, ordinary language philosophers, action theorists, and so forth, who are concerned to “save the subject.”

Habermas, however, crosses over the “ontological hiatus” between speaking nature and nonspeaking nature in a way which, on his own terms, is literally illicit. In a discussion of ethnology, he maintains that we are to understand the seemingly teleological behavior of animals by reasoning “privately” from human intentionality.

Similarly, in response to the question whether Darwinian theory belongs to the empirical-analytic sciences and is for that reason constituted with an interest in technical control, Habermas answers: “Since the evolution theory has a methodological status which is quite different from a normal theory in, say, physics, I think that the categorical framework in which the evolution theory has been developed since Darwin presupposes some references to a reunderstanding of the human world and not only of nature. The whole concept of adaptation and selection presupposes some elements which are more characteristic for the human sciences than for the empirical-analytic sciences, strictly speaking. So in my opinion, the evolution theory is no example of empirical-analytic science at all. But as far as biochemical theories about mutations go into evolution theory, we have, of course, a usual empirical-analytic theory. However, this is not what is characteristic for the design of evolution theory. This is only a component of the evolution theory: Modern genetics is not dependent on the evolution theory framework. Modern genetics is, I propose, a strictly objectifying theory which makes no use of concepts inherently related to our reunderstanding of what social life or cultural life is.” How one should interpret this passage which is, unfortunately, unclear. Either Habermas is saying that evolutionary theory is an immature and inferior theory to the extent that it still contains anthropomorphic elements such as the concept of adaptation, in which case he must be committed to the controversial thesis that evolutionary theory can be reduced to molecular biology. Or, he is saying that those anthropomorphic elements are unlimitable and must be understood “privately” in which case one does not know how to
locate neo-Darwinian theory, for example, in his scheme of knowledge-constitutive interests.

While the idea of privative reasoning may make sense in the context of Aristotelian metaphysics, where a continuity of being is presupposed, in Habermas's case, where no such continuity is assumed, it strikes me as peculiar. Earlier it has been shown that Habermas's attempt to combine materialism and transcendentalism leaves a radical hiatus between prehuman and human nature. This hiatus cannot be legitimately crossed until an adequate account of the production of human nature by prehuman nature has been provided. Here, however, we find Habermas traversing that hiatus, albeit in a backward direction. Two questions thus arise: How can he methodologically justify this kind of private reasoning which appears to violate the fundamental division of his philosophical construction? And, does this type of reasoning not presuppose that there is some continuity between nonspeaking and speaking nature—some "communality of life"—by virtue of which "private" reasoning can legitimately take place? And once we can reason privately in a backward direction, what is to prevent us from reasoning in a forward direction and conceiving of prehuman nature as incipient spirit?

This notion of incipient spirit might, in turn, form a basis for an ecological ethics from a naturalistic perspective.

Critical Theory and Ecological Ethics

Habermas has nowhere discussed "ecological ethics." It would therefore be fruitful to construct what his position might be given the main tenets and constraints of his theory. More specifically, how, given his thoroughlygoing anthropocentrism, which rules out the possibility of nature as an end-in-itself, might he argue for the protection of the natural environment? How, in other words, would he think a resolution to the environmental crisis without appeal to anything like "the resurrection of nature"?

At the most general level, the point would have to be that an end to the disharmony between man and man would entail an end to the disharmony between man and nature. A solution to the ecology crisis would therefore follow from a solution to the "social question" and it would not be necessary to develop a qualitatively new relationship to the natural world. Were this in fact the case, a communicative ethics, inasmuch as it would provide us with the proper principles for adjudicating the conflicts between humans, would be sufficient for deriving an ecological ethics. The proper norms for regulating the relation between society and nature would somehow flow from the communicatively conceived idea of the human good life without reference to nature as an end-in-itself. It would have to be shown that the preservation of the natural environment ("the good-for-nature") was somehow entailed by the communicatively conceived good-for-man.

Put in somewhat more concrete sociohistorical terms, Habermas might argue as follows. The ecological crisis is, at its roots, caused by the strain that the incessant expansion of the economy—which enlists science and technology for its purposes—places on the natural environment. Habermas observes that "traditional societies," in which the economy is embedded in a larger ethico-institutional matrix, always placed intrinsic limits on economic and technological growth: "The expression 'traditional society' refers to the circumstance that the institutional framework is grounded in the unquestionable underpinning of legitimation constituted by mythological, religious, or metaphysical interpretation of reality—cosmic as well as social—as a whole. 'Traditional societies' exist as long as the development of subsystems of purposive-rational action keep within the limit of the legitimating efficacy of cultural traditions. This is the basis for the 'superiority' of the institutional framework which does not preclude structural changes adapted to a potential surplus generated in the economic system but does preclude critically challenging the traditional form of legitimation."54 With the rise of modern, capitalist society, the economy becomes disembedded from the ethicoinstitutional framework—that is, the differentiation of the market—and economic activity becomes "denormatized" or "emancipated.

The result of this process, as Aristotle had already comprehensively predicted, is that a new dynamism is unleashed in the economy in which growth, including the expansion of human needs, tends toward the unlimited: "It is only since the capitalist mode of production has equipped the economic system with a self-propelling mechanism that ensures long-term continuous growth (despite crises) in the productivity of labor that the introduction of new technologies and strategies, that is, innovation as such, has been institutionalized. . . . Capitalism is the first mode of production in world history to institutionalize self-sustaining economic growth."55

The disembedding of the economy and its subsequent expansion tends to dissolve the traditional frameworks in which it was formerly situated, and which served to legitimate the social order as a whole. And, interestingly enough, the very thing that served to undermine the previous forms of legitimation itself becomes—after bourgeois consciousness "grew cynical"—the new principle of legitimation: in advanced capitalist society, institutionalized economic and technological progress becomes the new principle of legitimation, which is a peculiar principle of legitimation indeed. Viewed from the perspective of not only the philosophical tradition, but of traditionalism in general, this amounts to something like a huge "category mistake." Economic and technological progress belong to the realm of the technical, not the practical or the normative, and therefore cannot properly serve as legitimating, that is, normative, principles. Thus, it is Habermas's contention that (late) capitalist
society, through the hypostatization of science and technology into ideology, has for the first time in history attempted to suppress the normative dimension of socisc. Due to this state of affairs, questions bearing on the character of good life are not submitted to public political debates about the "good life," but are left to the administrative decisions of technical experts.

Contemporary modes of positivist and neopositivist thought contribute to this suppression of the normative dimension in that they maintain that questions of value lie beyond the purview of rational adjudication and can therefore only be decided by extrarational means. The theoretical level, where it is held that questions of value cannot be rationally discussed, and the practical level, where what were traditionally ethical-political questions are answered through technical means, thus serve to reinforce each other in advanced capitalist society. Communication theory, as I have tried to show, seeks, through its critique of science and its reinstatement of the legitimacy of practical reason, to defend the possibility of rational discussion of the good life and the goals of social development. And, if this renewed normative political discussion were translated into a program of action which eventuated in a radical transformation of society, one of the results of that transformation would presumably be the subordination of the economy—as well as of scientific and technological activity—to the collectively conceived idea of the good life. The economy, in short, would become "re-embedded." However, in contrast to premodern societies, where the institutional framework in which the economy was embedded ultimately rested on tradition, here the institutional framework would be grounded in a rationally formed consensus.

It is important to stress that, as opposed to Marcuse, it is not incumbent on Habermas, given the strategy outlined, to formulate a new mode of mediation between society and external nature; that is, a "new Science," nor does he think such a science possible. Habermas maintains that modern science and the outlook toward the natural world sedimentsed in it are rooted in the anthropological endowment of the species and therefore cannot be transcended. The impossibility of a New Science does not, however, present a difficulty for him. He contends that the pernicious effects of modern science and technology, presumably including the "new environment," do not derive from modern science and technology per se, but modern science and technology in conjunction with the charismatic forces of the market. Modern science and technology are not themselves intrinsically expansionist and rapacious, but are driven by the charismatic forces of the capitalist economy. In a different socioeconomic context, where their use was detached from the requirements of capitalist accumulation and directed toward the realization of a clearly conceived vision of the good life, the destructive aspects of modern science and technology could be contained and their beneficial aspects could be selectively chosen.

I have tried to show how, given the perspective of a communicative ethics, a solution to the ecology crisis might possibly be conceived. Most importantly, if a solution to the crisis in the social sphere would entail an end to the lethal stress that that sphere places on the biosphere, there would be no need to go beyond the limits of an anthropocentric framework. One need not, that is, envision the "resurrection of nature." Nature will remain objectified from the constitutive standpoint of modern mathematical science—which means that it will remain constituted as an object of instrumental control—and no rational possibility for taking nature as an end-in-itself will exist. The major difference will pertain to the socioeconomic context within which nature is objectified and not to the way in which nature is objectified.

This solution is certainly plausible and internally coherent. Moreover it is not in danger of violating some of the most fundamental principles of modern rationalism, thereby risking an irrationalist regression, as are some of the more radical proposals for the ecology crisis. However, despite these advantages, two questions must be examined. First, with respect to ethical theory, can imperatives with strength adequate to the unprecedented tasks posed by the ecology crisis be made on anthropocentric premises? Could, for example, binding imperatives which oblige us to protect species from extinction be formulated on purely anthropocentric grounds? Secondly, even if it could be shown that it is not necessary to move from the standpoint of anthropocentrism to formulate solutions to the environmental crisis, a question would still remain at the level of social psychology. For it is difficult to imagine how the conflict between society and nature is going to be resolved without a major transformation in our social consciousness of the natural world—for example, a renewed reverence for life.

**Conclusion**

In conclusion, I would like to step back and consider the larger issues at stake in this discussion. These issues concern the deep ambivalence toward modernity that can be traced throughout the history of the Western revolutionary movement. On the one hand, one often finds left radicals speaking as if they, and not the powers that be, were the true defenders of the values of the modern Enlightenment—for example, autonomy, conscience, individuality, and so forth—and that the goal of a revolution would be the completion of the Enlightenment's program rather than its negation. In this case, the current social crisis is seen as resulting from an uncompleted modernity which is, for that reason, at war with itself. On the other hand, left radicals also speak at times as if modernity itself were corrupt through and through, and what is therefore required is a transvaluation of contemporary values and a radical break in the historical continuum. In this case, the values of the Enlightenment are viewed as in no sense valid, and are seen as nothing more...
than the ideological rationalizations for a thoroughly corrupt social order. Needless to say, these positions represent ideal types and one rarely, if ever, finds them in their form.

Habermas, who is far less ambivalent than his predecessors at Frankfurt on this score, is a primary example of the first problem. He seeks to criticize modern bourgeois society in terms of its own ideals in order to facilitate a process of political enlightenment which could, in turn, lead to the transformation of that society. In this approach, Habermas, like the younger Marx, assumes that valid norms of sociation have already been recognized, and what is required is a program of immanent critique. The modern state, which attempts to legitimate itself through appeal to rational norms, is an inappropriate instantiation of intrinsically valid principles, and the fact that it is in conflict with itself presents the point of entry for critique. Habermas goes so far as to argue—the thesis of one-dimensional society notwithstanding—that social criticism is easier in bourgeois society than in previously existing societies. This is due to the fact that bourgeois society is the first to attempt to legitimate itself through reference to rationally validated norms rather than to dogmatic tradition. We can see here that one of the unsolved questions of the early Frankfurt School—that is, where do standards of critique come from—is answered for Habermas: the standards are the "de-ideologized" norms of bourgeois society itself.

The norms of bourgeois society do, however, have to be "de-ideologized," and this "de-ideologization" is one of the many theoretical tasks that communication theory is designed to accomplish. Habermas is truly Hegelian in that he holds that values possessing a truly universal, transhistorical validity were recognized during the period of the bourgeois-democratic revolutions. To be sure, these norms were enshrined by the bourgeoisie to rationalize the capitalist order. However, it is not so much, as the traditional Marxist interpretation has it, that the bourgeois presented its own particularistic values as universal, but that it adopted and distorted genuinely universal values for its own purposes. Intrinsically valid norms rode into historical recognition, so to speak, on the back of the emerging capitalist order. The desideratum, therefore, is to detach the intrinsically valid norms from their ideological functions, which means to disassociate "bourgeois right" from its economic interpretation. By reinterpreting the content of "bourgeois right" in terms of human communication, rather than on the contractual model of economic exchange as the modern natural right theorists had, Habermas hopes to separate its rational kernel from its ideological husk. It should therefore not be surprising that the values which Habermas claims are counterfactually presupposed by all human communication are precisely the central values of the bourgeois-democratic revolutions.

As opposed to the critique that rejects modernity as a whole, Habermas's strategy has one distinct advantage: it does not have to enlist standards whose validity has not already (at least tacitly) been recognized. Once the values of bourgeois society have been "de-ideologized," social theory has critical norms at its disposal which are immanent in, and in principle generally recognized by, the existing order. It has a foothold in the world, on the basis of which it can proceed immanently. Political theorists from Hegel to Arendt have recognized how difficult, if not impossible, it is to make successful appeal—as the proponents of our second position would have to do—to standards that are totally external to the established mode of Sittlichkeit. For in that case no implicit consensual basis exists for political argumentation and the establishment of such a basis itself appears to be a theoretical impossibility.

Habermas then can be located in the mainstream of the Enlightenment tradition. Accordingly, rational autonomy (Mündigkeit)—to be subject to laws of our own making rather than to the compulsions of inner or outer nature—constitutes the fundamental value that animates his project, as it did for such classical Aufklärers as Kant and Freud.

Also, in accordance with the classical conception of the Enlightenment, Habermas views the "disembedding from nature"—that is, the conquest of the external environment and the mastery of inner drives—as the process through which the goal of rational autonomy can be achieved. Shapiro has made clear the extent to which the Habermasian version of critical theory is conceived of as the culmination of the Enlightenment: "emancipatory thought, of which critical theory is one part, is not just a current in the history of ideas, or an ideological reflection of class struggle, but part of the process of sociocultural evolution itself. Critical theory is a component of what could be called the emancipatory subsystem of sociocultural evolution, whose differentiation into a separate subsystem marks a turning point in world history. This differentiation occurred in the context of the industrial and democratic revolution at the end of the 18th and the beginning of the 19th centuries. From the viewpoint of intellectual history, it can be dated at beginning with Kant, whose critical philosophy founded the distinctive emancipatory method that was developed in the Hegelian and Marxian dialectic. The specific function of the emancipatory subsystem is the control and direction of the evolutionary process itself. It articulates and makes reflexive the capacities for such control that are given in human nature but emerge autonomously only with the emancipatory subsystem. If the main obstacle to human freedom and rationality is the embeddedness in the past, then we can say that the emancipatory subsystem is a cultural learning mechanism for trying to solve the problem of escaping from and overcoming embeddedness." Let it be stressed that the conception of emancipation articulated in this passage remains thoroughly within a disenfranchised world view. The goal of emancipatory process is the completion of the disembodiment of humanity from nature, and the assumption of scientific and rational management, by that disembodied humanity, over the course of evolution. Not only does this conception reject the resurrection of inner or outer nature, but the goal of this process, the disembodiment from nature, is exactly what is viewed as the difficulty by proponents of the second position.
Habermas's vision lacks at the same time the pessimism as well as the utopianism of the earlier critical theorists. He does not assess the historical situation as being nearly so irremediable as they did, and is not compelled, therefore, to go to such radical lengths in thinking a solution. Thus, on the side of human nature, one finds none of the erotic or aesthetic utopianism in Habermas that was so characteristic of the early Frankfurt School. He takes rational autonomy as a perfectly adequate idea of selfhood, and feels no need to formulate an alternative emancipatory concept such as a new sensibility. Likewise, as we have repeatedly seen, since his quarrel is not with Galilean science as such, but with its hypostatization into the "proportion of a life form, of a 'historical totality,' of a life world," it is not incumbent on him to argue for an alternative science. All of this becomes very clear in Habermas's "discussion" with Marcuse, where Habermas tries to draw out the systematic interconnections within their respective positions. It is obvious that Habermas perceives a necessary connection in Marcuse between his sensuous conception of reason, his erotic and aesthetic utopianism, and his call for a new science, and he believes that, by moving to the standpoint of communicative rationality, these necessary connections can be broken and the more dubious aspects of Marcuse's theory avoided.

As Habermas has often been criticized for his thoroughly disenchanted stance toward the natural world, Shapiro tries to defend him on this count by arguing that the disembedding of humanity from nature is somehow equivalent to the resurrection of nature: "The dialectic of history is resolved through the completion of the self-transcendence of nature that occurs when embeddedness in nature is overcome and human beings bring the historical process under control. This self-transcendence is at the same time the 'resurrection of nature,' because it ends the conflict of nature with itself that was manifest in the embeddedness and the abstract contradiction between universality and its limits." It is difficult to see how the state of affairs described in this passage can be construed as the resurrection of nature. On the contrary, the situation described above is perfectly compatible with a totally disembodied and denaturalized humanity standing over against a thoroughly reified nature and manipulating it for its own purposes. This would represent the pinnacle of domination rather than its opposite. While the conflict between humanity and nature might no longer occur within nature, it would not, for that reason, be any less a conflict. Habermas's position may very well be correct, and we may have to give up the idea of the resurrection of nature as a romantic illusion, but in that case, let us at least be perfectly clear about what is at stake.

The genealogy of the second view I enumerated above can be traced to the more messianic and eschatological traditions rather than to the modern, bourgeois Enlightenment. Indeed, instead of conceiving of an emancipated society as somehow constituting the fulfillment of modernity, the advocates of this position tend to see modernity, "this nullity [which] imagines that it has attained a level of civilization never before achieved," as the original evil which is to be extirpated. The dissolution of more organic forms of solidarity and their replacement by a ubiquitous bureaucracy, the decay of great cities and the simultaneous urbanization of the countryside, the atomization of the individual, the substitution of formal for substantive justice, the ever-increasing danger to the earth's life-support systems, the constant threat of major war, not to mention the general banality of everyday life—these, and not the nobler sentiments of the Enlightenment, are held to comprise the essential reality of modern society. It is argued, therefore, that a social revolution must involve a radical hiatus in history so that a new social order can be established which differs from the existing historical constellation. Central to the new constellation would of course be a renewed relation to the natural world which would close the schism between society and nature that was opened with the rise of modernity and the methodical conquest of nature. Since this position entails such a radical discontinuity in history, it is extremely difficult, if not impossible, to identify "objective tendencies" striving in the direction of the type of society which is envisioned.

In this context, it is interesting that Wellmer explicates the difference between Habermas and the early Frankfurt School in terms of the question of historical continuity. For Horkheimer, Adorno, and Marcuse, liberation "as the negation of instrumental reason . . . would be the resurrection of external and internal nature as well as the beginning of a new history of man. While in Marx's theory there is a tendency to blur the historical discontinuity which would separate a liberated society from the universe of instrumental reason, the philosophy of the Frankfurt School is in danger of losing the historical continuity which alone would make socialism a historical project: liberation becomes an eschatological category." Because he introduces the categorical distinction between instrumental and practical reason, Habermas can determine the proper amount of discontinuity, as it were, between capitalism and a free society. Against Marx, who tends to see socialism as continuous with capitalism on the technical level so far as he sees a socialist society as the nearly automatic outcome of the development of the forces of production, Habermas insists on the need for a practical enlightenment and the formation of a new conception of the good life. And, against the early Frankfurt School, Habermas appreciates the sedimented norms of bourgeois society so that the gap between capitalism and socialism does not have to be so radical as to be impossible. Habermas, in short, asserts the enlightenment heritage of practical reason against its legacy of technical reason in order to achieve the fulfillment of the former.

The second version of radicalism we are examining, as it tends to view modernity as corrupt in toto, cannot locate points within the modern social order on which to base itself. It must, of necessity, seek values completely outside of the existing "reality principle" in terms of which to legitimate itself and to oppose the established order. Rather than understanding the values o
the bourgeois order of reason existing in an irrational form, this position views those values simply as the rationalizations for a system of domination. We are all familiar with contemporary attempts to ground radicalism in myth, art, fantasy, eroticism, play, and even insanity, all of which, more or less self-consciously, derive from the sort of assumptions we are discussing. And some of our most creative cultural commentary and artistic productions have undeniably come from this sort of avant-gardism. However, the attempt to uncover the promesse de bonheur in marginal phenomena has the unfortunate tendency of degenerating into a position which identifies marginality with progressiveness, in which case only the spiritual or material lumpen can become the agent of enlightenment.

In the 1960s one was more readily disposed to see the Enlightenment as the root cause of the contemporary social crisis and to recognize progressive tendencies in a much wider variety of cultural phenomena. The events of the intervening years, however, must have prompted every thinking person to reflect on his attitude toward the heritage of the West. Recent events in Iran, Cambodia, and Jonestown, to mention but a few, have dramatized the frailty of that tradition, the amount of resentment against it, and the very real danger of massive historical regression. Moreover, many of the cultural phenomena which seemed so progressive in the past have subsequently revealed their reactionary sides. In this context, a program such as Habermas', which envisions the fulfillment of that tradition, despite its many difficulties appears as the appropriate item on the historical agenda. And yet, at the same time, one is puzzled by the sense that the vision, however laudable, is inadequate to historical reality. One's "partiality for reason" notwithstanding, it is often difficult at the level of political reality to discern the cunning of reason at work in the historical events we witness daily. It may be that the scope and depth of the social and ecological crisis are so great that nothing short of an epochal transformation on the scale of world views will be commensurate with them. While talk of an epochal transformation may sound grandiose, it must be remembered that they have occurred before—for example, with the emergence of the Greek polis, the rise of Christianity, and the Reformation—and, however unsettling the prospect may be, we cannot rule out the possibility that we are in the midst of such a transformation today.

Notes


3. Of the two, Bookchin had by far the greater impact on my development. Politically, he helped me to extricate myself from the authoritarian and violent deterioration of the New Left and to develop an appreciation of the importance of the ecological crisis.

4. One notable exception has been a recent paper given by Peter Lews in the Philosophy Department of the New School for Social Research on 3 February, 1994.


7. According to Horkheimer and Adorno, however, myth already contains the dialectic of enlightenment in nuce and the Enlightenment notion of rationality is not without mythical elements.

8. William Leiss attempts to defend Marcuse on the criticisms that have been raised against his notion of a new science. However, as D’Amico has pointed out, Leiss’s defense tends to be more textual than substantive. That is, by the time Leiss is through reconstructing Marcuse’s position on the necessity of a new science, it appears indistinguishable from Habermas’ so that Leiss never takes up the substantive questions about a new cognitive mediation between society and nature in an adequate fashion. See “Appendix,” in The Domination of Nature (New York: George Braziller, 1972), and Robert D’Amico’s review of that work in Telos 13 (Spring 1973). Murray Bookchin, on the other hand, argues that we already have the makings of a new science in ecology. However, the argument is extremely suggestive, Bookchin has yet to show that his position can avoid the theoretical difficulties that confront such an approach and which are discussed below. See Murray Bookchin, “Toward an Ecological Philosophy,” in Philosophia: Ecology and Philosophy, ed. F. L. Van Damme, 13 (1974).

9. Albrecht Wellmer observes that, their criticism of Marx notwithstanding, Adorno and Horkheimer were the heirs of his monism: “... the latent reductionism ... of this philosophy of history has survived in the philosophy of the Frankfurt School, although, as it were, with inverted signs. This comes to the fore, I believe, in Adorno and Horkheimer’s Dialectic of Enlightenment. For here ‘instrumental reason’ becomes the category by which both dimensions of the world-historical process of civilization are conceived, namely the transformation of external nature (technology, industry, domination of nature) as well as the transformation of internal nature, individualization, repression, forms of social domination.” Wellmer, “Communication and Emancipation: Reflections on the Linguistic Turn in Critical Theory,” in On Critical Theory, ed. John O'Neill (New York: The Seabury Press, 1976), p. 245.


13. Both thinkers want to (1) criticize the positivism of their day, in large part (2) to avoid the skepticism that inevitably accompanies it. Where Kant had the classical British empiricists as the object of his critique, Habermas concerns himself with the contemporary varieties of scientism (including Marxist), especially as they affect our conception of the social sciences. The transcendental critique of positivism, in both cases, proceeds through (3) a reflection on the conditions of the possibility of knowledge which is meant to serve the dual purpose of (4) exposing the dogmatically held assumptions of positivism and of validating the fundamental principles of our knowledge in the various epistemological regions. Ultimately, Habermas’s transcendental reflec-
tion, like Kant’s, seeks to determine the objects of possible experience in order to establish the scope and validity of our knowledge.


15. It is interesting to note that, evolutionarily, the very fact which made human intelligence and language physiologically possible, larger brains and heads, also necessitated the extended period of dependency which makes the acquisition of culture possible. “Language and culture . . . select for bigger heads. Bigger heads mean greater difficulty in parturition. Even today, the head is the chief troublemaker in child birth. The difficulty can be combatted to some extent by expelling the fetus relatively early in its development.” There was therefore a selection for such early expulsion. But this, in turn, makes for a longer period of helpless infancy—which is, at the same time, a period of maximum plasticity, during which the child can acquire the complex extra-genetic heritage of the community.” Quoted in Theodoros Dobzhansky, Evolution and Transcendence, in The Problem of Evolution: A Study of the Philosophical Repercussions of Evolutionary Science, ed. John Eccle and Raimond Nogar (Englewood Cliffs, N.J.: Prentice-Hall, 1973), p. 98.


22. Habermas, Knowledge and Human Interests, p. 312, emphasis added.


27. See Habermas, Knowledge and Human Interests, p. 41.


29. While I have not considered Habermas’s more recent theory of “reconstructive science,” which has tended to replace transcendental anthropology as his foundational theory, the same sort of objections could be raised against it as well. See McCarthy, The Critical Theory of Jürgen Habermas, pp. 278–279.

30. Habermas, “A Postscript to Knowledge and Human Interests,” p. 165. Transcendental philosophy’s goal of providing validation of our fundamental epistemological principles, as Hegel so brilliantly saw, seems to involve the dilemma of requiring, as he put it, that one be able to swim before entering the water. The act of claiming validity for epistemological principles is already a claim to knowledge, albeit of a very peculiar sort. As such, its own standards must themselves already have been validated and, in principle, be justifiable. At the heart of every transcendental philosophy in the strict sense there must therefore be a theoretical device to overcome this dilemma. Thus, for example, Kant’s transcendental deduction is meant to be a unique form of argumentation which can avoid the problem of self-reference. And, Husserl’s phenomenological epoché is designed as a preparadigmatic to place one in a privileged position from which basic epistemological principles can be clarified. There exists no such theoretical device in Habermas; he seems too wont to the advantages of transcendental philosophy without confronting the dilemmas.

31. Habermas, Knowledge and Human Interests, p. 9.

32. Ibid., p. 311.


38. By introducing a dualistic framework to overcome the shortcomings of his predecessors Habermas is following Lukács earlier in the century. Whereas Habermas introduces his dualistic framework to correct the monism of Horkheimer and Adorno, Lukács introduced his to correct the monism of Engels and the Second International. In both cases the goal is to “save the subject.” Despite their intentions, Horkheimer and Adorno did not have the categories needed to formulate an adequate notion of subjectivity and Habermas introduces the distinction between instrumental and communicative rationality for that reason. Likewise, Lukács, who was concerned to save the subject in the face of the “reification of consciousness”—a reification which ran counter to the expectations of Marxian theory, criticized the monism of Engels’s dialectics of nature. Lukács, who came out of neo-Kantian milieu, argued that dialectics did not pertain to the realm of nature, but only to the realm of history. Nature could be properly treated by natural science. Marxism, misfitted as it treated subjectivity as an epiphenomenon of the quasi-natural (Naturwissenschaft) process of production, Lukács argued, could not adequately deal with the problem of the reification of consciousness. See Georg Lukács, “Reification and the Consciousness of the Proletariat,” in History and Class Consciousness, trans. Rodney Livingstone (Cambridge, Mass.: The MIT Press, 1971); Alfred Schmitt, The Concept of Nature in Marx, trans. Ben Fowkes (London: New Left Books, 1971), pp. 51ff.; and Andrew Arato, “Lukács’s Theory of Reification,” Teks 11 (1972): 41ff.


40. Habermas, Knowledge and Human Interests, pp. 32–33. See also “Technology and Science as ‘Ideology,’” in Toward a Rational Society: Student Protest, Science and Politics, trans. Jeremy Shapiro (Boston: Beacon Press, 1970), pp. 85ff. While I shall continue to use the term “reconstruction of nature,” only because it has already entered the literature, it prejudices the discussion. It prejudices the issues whether we can rationally get beyond Galilean science by insinuating that all such attempts are necessarily quasi-religious.


42. Murray Bookchin makes an even stronger claim: he argues that not just biology, but the science of ecology itself constitutes a major anomaly for Galilean science. The generalizing tendencies of deductive-nomological science will always violate the specificity of “eco-systems,” each of which is a unique entity. It is therefore necessary, to use Habermas’s language, to enter into a quasi-communicative relationship


48. As one eminent biologist has noted: "What finally produced a breakthrough in our thinking about teleology was the introduction of new concepts from the fields of cybernetics and new terminologies from the language of information theory." See Ernst Mayr, "Teleological and Teleonomic: A New Analysis," in Evolution and the Diversity of Life (Cambridge, Mass.: Harvard University Press, 1976).

49. The locus classicus of this position is Arturo Rosenblueth, Norbert Wiener, and Julian Bigelow, "Behavior, Purpose and Teleology," Philosophy of Science 10 (1943).

50. This attitude is evident in Ernst Mayr's suggestion that we should, in light of current knowledge, return to Aristotle's biological texts and replace the term "idos", wherever it appears, by the term "DNA formula." "Teleological and Teleonomic," p. 400.


54. Habermas, Knowledge and Human Interests, p. 33.


58. Habermas, "Technology and Science as 'Ideology,' " p. 95.

59. It id., p. 96.

60. It id., p. 87.
