

KNOWLEDGE, OBJECTS AND INTERESTS*

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Habermas's theory of knowledge-constitutive interests (initially outlined in the Introduction) is intended to challenge what he regards as the 'false objectivism' of positivism's conception of science and the relationship between theory and practice.¹ This objectivism has two related elements. First, there is the belief that the objects of scientific knowledge exist independently of the epistemological framework on the basis of which they are investigated. Second, there is the claim that such knowledge is value-free, in the sense that the validation of its claims is independent of the acceptance of normative standpoints.

According to these objectivist principles, scientific theories are seen as related to practice in the following way. Theories enable us to make conditional predictions about the likely outcomes of a possible course of action. But the ends or values guiding such actions are given independently: that is, they are neither entailed nor presupposed by scientific knowledge itself. Thus scientific theories may be used in practice in various ways, guided by different values; and normative critique is relevant only to these uses of knowledge, not to the acceptance or rejection of the theoretical claims of science itself. Against this view, Habermas argues that the object-domains of forms of knowledge, and their appropriate criteria of validity, are constituted by certain interests; and that the possible forms of practical application of scientific knowledge are determined by this interest-constitution. Thus scientific knowledge is not neutral, normatively; and its objects do not belong to an independent reality.

Habermas develops his position in terms of a threefold division between different forms of knowledge, which I outlined in the Introduction. In this chapter I will focus mainly on the first of

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these, empirical-analytic science with its technical interest, though with occasional references to the second, historical-hermeneutic science with its practical interest. His account of the third form, critical knowledge, will be discussed in chapters 4 to 6. I will argue here that we should entirely reject the interest-constitution theory but not the claim that there are different forms of knowledge - though my account of the relations between them differs from Habermas's.

I begin in the first section by criticizing an argument developed by Brian Fay which is designed to support Habermas's technical interest doctrine by analysis of the implications of the positivist account of scientific explanation. In section 2, I examine Habermas's conception of object-constitution in empirical-analytic science, and show that it does not - as some critics have maintained - depend upon an instrumentalist account of the cognitive status of scientific theories. In the following section I criticize Habermas's object-constitution doctrine by displaying internal inconsistencies in it. In section 4, I present an alternative view, which challenges the dichotomy between nature and human society implicit in Habermas's position. I argue instead for an ontological pluralism, in which a variety of different kinds of existents are recognized, with complex relations of qualitative identity and diversity between them.

1. Deductive-nomological explanation and the technical interest

In *Social Theory and Political Practice*, Fay argues both that the kind of knowledge produced by a positivistically conceived science is such that it can (and can only) be used for the purpose of predicting and controlling natural or social processes, and also that this possible use is in fact constitutive of what is regarded as knowledge.² It is this second claim that is crucial here, since by itself the first is perfectly compatible with a rejection of the interest-constitution doctrine. For the former claim could be accepted by positivists who regard scientific knowledge as interest-free: they could argue that the possibility of technical use is simply a consequence of the fact that scientific theories make statements about the relationships that hold in an independently existing real world, and that knowledge of these relationships, quite unsurprisingly, may provide the basis for prediction and control. I shall argue that Fay does not succeed in establishing anything more than this epistemologically innocuous claim; though, as will be seen, certain complications arise when we take account of the differences between instrumentalist, positivist and theoretical realist views of science.

Fay's main argument for technical interest-constitution is based on a central feature of the positivist view of science, the deductive-nomological (D-N) model of explanation. He tries to show that according to this model the possibility of prediction (and thus of control - I will from now on consider only prediction, for the sake of simplicity) is constitutive of what is to count as explanation. This, he believes, would enable his main claim to be established, given the further (and plausible) premiss that,

for positivists, science aims at gaining explanatory knowledge.

According to the D-N model any adequate scientific explanation requires that a statement describing the *explanandum* (the item to be explained) be deducible from a set of premisses, which contains statements of two kinds: those specifying putative universal laws, and those specifying various particular, antecedent conditions. These two sets of statements describe the *explanans* (that which explains); and explanation consists in deriving the *explanandum*-statement from the *explanans*-statements.

Fay points out how defenders of the D-N model - particularly Carl Hempel, its best-known and most sophisticated advocate - maintain that an important feature of this model is its expression of 'the thesis of the structural identity of explanation and prediction'. This thesis, as Hempel has emphasized, consists in two sub-theses: first, that any adequate explanation must be potentially usable as a prediction (either of the event initially explained, before it occurred; or of an event of the same kind, later); and second, the converse of this.⁴ Fay accepts Hempel's defence of the first sub-thesis against a number of objections, which need not concern us here. He does not consider the objections that have been put to the second sub-thesis, apparently regarding the first as sufficient for his argument to succeed. This, I think, is a mistake; and indeed, at some points Fay appears implicitly to assume the truth of both. But as I will argue shortly, though there are in any case grounds for doubting the truth of the second sub-thesis, even if it were true Fay's argument would still not work. For the moment, however, I will regard both sub-theses as correct.

Fay argues that the truth of the structural identity thesis shows that for a positivist conception of science, explanation *consists in* predictive power; for what it is that makes D-N arguments 'explanatory' is that 'they allow one to claim that he *could* have predicted the occurrence of the event if he had been able to have all the relevant information at hand'.⁵ In other words, it is the possibility of its predictive use that is definitive, or constitutive, of what it is for something to count as an explanation. I believe Fay is wrong in presenting this as an implication of the D-N model. My objection can be presented in the form of a possible reply to Fay by an advocate of the D-N model.

The reply is this. The structural identity thesis is to be seen as a consequence of the D-N model, but it does not specify what it is that defines the nature of an adequate explanation. The D-N model should instead be seen as a formal elaboration of the basic idea that to explain something is to show that it is an instance of a scientifically established law; and statements of laws are to be taken as descriptions of relationships that hold, universally, between certain kinds of independently existent items (events, processes, states of affairs, etc.) To explain something is to show that it conforms to these laws; and to predict something we require knowledge of them. So although it is true that what we need to know in

order to predict something is the same as what we need to know to explain something, this is not because explanation consists in the possibility of prediction, but because it consists in the knowledge of laws, which can be used for both explanatory and predictive purposes.

In effect, this reply involves the development of a point made at the beginning of this section: that one cannot argue from the fact that, on a positivist view of science, scientific theories provide the basis for prediction and control, to the claim that it is the possibility of this use that is constitutive of scientific knowledge. Thus, when Fay asks the question, ‘why is it the case that in science to explain something is to potentially predict it?’, and gives as his answer the constitutive interest doctrine,⁶ he ignores the possibility of an alternative answer: that this is because science discovers real relationships between phenomena, that enable us both to predict and explain.

However, in order to recognize the possibility of this alternative answer, we have to avoid confusion about the sense of the ‘is’ in Fay’s question. It might be taken to mean, ‘is defined by the ability’ (to potentially predict); or, ‘puts one in a position’ (to potentially predict). The former sense automatically gives Fay his preferred answer, whilst the latter leaves open the alternative answer. But acceptance of the D-N model and the structural identity thesis does not entail that the former sense of ‘is’ is the only appropriate one.

Further, whatever plausibility Fay’s argument has requires acceptance of both sub-theses of the structural identity of explanation and prediction, and not merely the first. Thus, his position would be additionally weakened by rejection of the second, that any law-based prediction is potentially an explanation. I believe there are strong reasons for denying this, but I will not present them here - though it is worth noting that Hempel himself has accepted some of these.⁷ Instead, I will now go on to suggest that the constitutive interest doctrine could be more persuasively argued if an instrumentalist conception of science were adopted, rather than a positivist - or even more so, a theoretical realist - one. Indeed, I suspect that Fay is partly misled by the fact that there are some ways of articulating the positivist view which make it very similar to instrumentalism.⁸

Instrumentalists regard the truth or falsity of scientific theories as consisting in their predictive (or manipulative) success or failure. That is, they adopt a pragmatist theory of truth, and regard scientific theories as ‘true’ only in the sense of being useful tools or instruments. On this view, the claim that an interest in technical control is constitutive of what is to count as scientific knowledge clearly has considerable plausibility. And Fay’s argument about the D-N model of explanation, appropriately reconstructed to apply to an instrumentalist version of it, would illustrate this definitional link between explanation and the possibility of prediction. For with an instrumentalist conception of science, what positivists regard as true statements expressing laws, from which other statements

describing the *explananda* may be deduced, are instead regarded as devices or instruments for making predictions. (One possible instrumentalist version of the D-N model would involve the re-conceptualization of law-statements as inference-rules: for rules, unlike statements, have no truth-values).

I conclude therefore that Fay's argument for interest-constitution fails in the case of positivism and, *a fortiori*, in the case of theoretical realism. It might succeed when directed at instrumentalism. But instrumentalism is not, in my view, a correct account of the cognitive status of scientific theories, though I cannot support this here. In any case, I will argue in the next section that Habermas's version of interest-constitution does not depend upon adopting an instrumentalist view of science, but would apply equally well to positivism, and probably to at least some forms of theoretical realism.

However, it should be noted that Fay's defence of technical interest-constitution does not depend solely upon the argument just examined; and a brief consideration of his second argument will introduce some important issues to be explored in the next two sections. He suggests that there is a conceptual connection between the interest in technical control, and the ontology (in Habermas's terms, the 'object-domain') of a positivist science. Thus he says that for positivists 'reality is comprised of observable objects and events that are related nomologically', and that this ontology is determined by the constitutive interest in prediction and manipulation.⁹ That this is so, he argues, can be brought out by recognizing that historically there have been radically different scientific ontologies, reflecting different interests. For instance, he draws our attention to:

the long tradition in Western thought which holds that to explain something is to show its final cause, i.e. to demonstrate its purpose in the scheme of things,¹⁰

of which the Christian world-view is one example. (Presumably, another would be an Aristotelian cosmology.)

A world-view of this kind, he suggests, involves a different conception of what it is to understand a phenomenon; and (though he does not say this explicitly), its ontology will be essentially related to this, in that 'objects' will be defined in terms of basic properties that are teleological or meaningful, as compared, say, with the basic properties of Galilean or Newtonian science, represented by Locke as the 'primary qualities': size, shape, motion, and so on. Fay implies that these rival ontologies are constituted by different fundamental attitudes or interests, whose adoption is in some sense a matter of convention. Thus:

It is important to remember . . . that there exist alternative conceptual schemes which give different accounts of what it means to understand something. What the concept ‘understand’ means depends on human conventions.

Now it seems to me that it would follow from Fay’s comments here that there is nothing intrinsically mistaken about the practice of some kind of hermeneutic science of nature: that is, one that conceptualizes ‘nature’ as a meaningful entity open to an interpretative understanding involving, for instance, teleological concepts. Such a conception of nature would express a different, non-technical, constitutive interest; and it would be mistaken to make any attempt to reject it on the grounds that ‘in reality, nature is not like this’, since this claim could be made only from the standpoint of a conception of reality (and thus of explanation and understanding), itself constituted by a different interest, whose adoption is a matter of human convention.

I will not criticize this view now, though I am strongly opposed to it for reasons which will emerge in section 3, where I criticize Habermas’s interest-constitution doctrine. But first I will give a fuller account of Habermas’s doctrine than I have so far, and show why it does not presuppose an instrumentalist view of science.

2. Habermas’s interest-constitution theory and instrumentalism

A recurrent criticism of Habermas’s view that the technical interest is constitutive of empirical-analytic science has been that it presupposes a (mistakenly) instrumentalist conception of the cognitive status of scientific theories.¹² Habermas has persistently denied that this is so;¹³ and in various papers written after *Knowledge and Human Interests* he has developed a theory of truth as the validation of scientific claims in what he terms ‘discourse’, which clearly differs from most forms of pragmatism.¹⁴ My view is that there are definitely instrumentalist elements in *Knowledge and Human Interests*, and certain papers written before then, but that those could easily be eliminated without affecting the basic elements in his account of empirical-analytic science. In showing that this is so, I aim also in this section to clarify precisely what his interest-constitution theory involves.

It may be helpful to articulate Habermas’s position by noting both what he accepts, and what he rejects, from Kant’s epistemology (or, at least, from his interpretation of this).¹⁶ First, he accepts that there is a basic dichotomy between subject and object, regarding it as plausible and necessary to postulate the existence of an independently existing externality, whose ‘facticity’ exercises objective limitations upon our (human) attempts to satisfy needs in technical activities such as economic production. In this respect, Habermas rejects Hegel’s attempt to transcend the subject-object dichotomy by viewing ‘nature’ as itself an objectification of a supra-human subjectivity, or *geist*. Thus Habermas speaks of ‘the autonomy of nature and the remainder of complete otherness that is

lodged in its facticity', and says that:

Its independence manifests itself in our ability to learn to master natural processes only to the extent that we subject ourselves to them. This elementary experience is expressed in the language of natural 'laws' which we must 'obey'. The externality of nature manifests itself in the contingency of its ultimate constants. No matter how far our power of technical control over nature is extended, nature retains a substantial core that does not reveal itself to us.¹⁷

Second, Habermas also accepts from Kant that this externality only becomes an 'object' for us - that is, an object of knowledge - when mediated through a specific set of basic categories: these categories, imposed by the subject, are thus constitutive of what he terms 'the objectivity of the possible objects of experience'.¹⁸ So for Habermas the Kantian categories are constitutive of the object-domain of empirical-analytic science, while it is nonetheless true that, at another level of analysis, there is a non-subject-dependent externality.

Habermas's major departure from Kant consists in denying that the object-constituting categories are imposed by a transcendental consciousness, and insisting instead that they are imposed by the human species, expressing its fundamental interest in control, in the success of rational feedback-controlled instrumental action. This interest is rooted in a particular, species-universal and invariant form of activity, namely labour. Habermas claims that Marx recognized this in his epistemological writings, seeing that:

labor, or work, is not only a fundamental category of human existence but also an epistemological category. The system of objective activities [i.e. object-producing, productive activities] creates the factual conditions of the possible reproduction of social life *and at the same time* the transcendental conditions of the possible objectivity of the objects of experience. The category of man as a tool-making animal signifies a schema both of action *and* of apprehending the world.¹⁹

Whether this is a defensible exegesis of Marx - which is, I believe somewhat doubtful²⁰ - is irrelevant here. Nor, in this context, need we consider the way Habermas - in this case rightly, I believe - goes on to criticize Marx for failing to recognize the distinctive character of the other fundamental dimension of 'the possible reproduction of human life', namely language and communicative interaction. What is important is to focus upon Habermas's replacement of Kant's transcendental deduction of the categories by a theory according to which these are instead to be seen as anthropologically determined. Thus:

the unity of the objectivity of possible objects of experience is formed not in transcendental consciousness but in the behavioural system of instrumental action,²¹

and:

The conditions of instrumental action arose contingently in the natural evolution of the human species. At the same time, however, with transcendental necessity, they bind our knowledge of nature to the interest of possible control over natural processes. The objectivity of the possible objects of experience is constituted within a conceptual-perceptual scheme rooted in deep-seated structures of human action; this scheme is equally binding on all subjects that keep alive through labor.²²

In his later 'Postscript' to *Knowledge and Human Interests*, Habermas attempts to clarify his position, with respect both to its anthropological character, and to its consequences for the understanding of scientific concepts. In a somewhat dense passage, he says that scientific theories can only be constructed 'within the *limits* of prior objectivation of experienceable occurrences', and explains this as meaning:

in a theoretical language whose fundamental predicates are always related to the independently constituted objects of possible experience. The theory languages, which undergo a discontinuous development in the course of scientific progress, can interpret the structures of an object domain not yet penetrated by science. They can also to some extent reformulate them. But as long as we are not angels or animals, these languages cannot transform the structures themselves into conditions of another object domain. It is always the experience of identical objects of our world which is being interpreted differently according to the state of scientific progress we happen to have reached. The identity of experiences in the manifold of the interpretations we produce of them is assured because of the conditions of possible objectivation. The particular view of quantum theory developed at Copenhagen provides considerable support for this position. It is argued there that the 'classical' conceptions needed to describe a measuring apparatus point up the limits of the autonomous object domain of bodies in motion. The non-classical theories of modern physics can interpret this domain differently but they cannot put a new object domain in its place.²³

I interpret this passage as making the following two claims. First, that the constituted object-domain of empirical-analytic science is a distinctively *human* one, in the sense that its nature and limits are generated by features of the human species, and that though the object-domain for a different, non-human species might differ from this, we cannot but accept the limits of our species-nature. Second,

all theoretical concepts within empirical-analytic science, at least to the extent that they are taken to have a denotative, referring function, must be subject to certain limits determined by the basic categories imposed, via its technical interest, by the human species. These (on the basis of Habermas's comments elsewhere ²⁴) are the categories of space, time, substance and causality. Thus Habermas's remarks about the Copenhagen interpretation of quantum mechanics amount, I think, to this claim: that no realist interpretation can be provided for those theoretical terms which, were they to be so understood, would involve commitment to the existence of items whose properties are not consistent with this categorial framework.

Now although Habermas's claim here is by no means unchallengeable, it is undoubtedly not an instrumentalist one. It does not involve a pragmatist theory of truth; nor does it involve the kind of operationalist account of the meaning of theoretical terms which many instrumentalists (along with some positivists) have adopted. Habermas is not adopting the instrumentalist-operationalist view that all scientific concepts must be defined in terms of sets of hypothetical statements about the observable outcomes of possible human operations. Nor is he saying that the truth of scientific statements consists in the success of actions based upon them; nor that theories are instruments for making predictions. Instead, he is claiming that the range of properties intelligibly ascribable to 'objects' is subject to the limitations of a categorial framework that is itself generated by the interest of the human species in technical control.

As I noted above, the ontological limitations proposed by Habermas are not unchallengeable. They do not, so far as I can see, involve a restriction of scientific ontology to what is observable (the characteristic positivist restriction ²⁵) since, for instance, the properties ascribed to atoms or molecules within classical physics meet his requirement. But the restriction might well rule out a realist interpretation of certain concepts employed in sub-atomic physics which depart from what is, in effect, a Newtonian-Kantian framework; and it runs counter to the kind of 'ontological catholicism' advocated by theorists such as David Bohm, who rejects precisely the restriction imposed by Habermas and accepted in the Copenhagen interpretation of quantum mechanics.²⁶

Though Habermas does not suggest such a parallel, I will conclude this discussion by comparing his position to Kant's in one further respect: the adoption of 'empirical realism' in combination with 'transcendental idealism'.²⁷ On the one hand Kant rejects the subjective idealism of, say, Berkeley, according to which the nature of perceptual objects is ideal and not material. On the other hand, the objects of knowledge are constituted by the imposition of the categorial framework of transcendental consciousness upon an unknowable externality. Thus, in effect, a realist view of the meaning of scientific statements is combined with an idealist view of the constitutive categories. Empirical realism for statements about the objects of experience: transcendental idealism for their constitution as

objects.

Now, as I have already noted, Habermas departs from Kant's transcendental idealism in certain respects: we might term his alternative position 'quasi-transcendental pragmatism'. In other respects, however, his position seems consistent with Kant's empirical realism. But if this is so, it is difficult to understand - or at least to sympathize with - Habermas's persistent opposition to any form of realist or correspondence theory of truth.²⁸ He does, of course, wish to combat the 'false objectivism' of positivist philosophy of science, with its supposed failure to recognize the interest constituted character of its scientific object-domain. But once this has been accomplished by his quasi-transcendental pragmatism, I can see no good reason for him to resist a realist theory limited, in this largely Kantian manner, to the realm of possible objects of knowledge. If I am right about this, then Habermas's development of a version of the consensus theory of truth, in opposition both to realism and pragmatism, is quite unnecessary. However, as I will argue in chapter 6, section 2, the way this theory functions in his attempt to provide a rational foundation for various norms, does not in fact depend upon its being accepted as a preferable alternative to realism.

3. Criticism of Habermas's interest-constitution doctrine

Having presented what I take Habermas's theory of knowledge-constitutive interests to be, in the case of empirical-analytic science, and shown that it is not open to the objection of instrumentalist presuppositions, I will now present a different objection to it, by arguing that there is a major internal inconsistency in his position. I do not regard this as the only legitimate criticism that can be made of the theory, though. For instance Thomas McCarthy has outlined an important objection based on the following apparently irresolvable difficulty in Habermas's position. On the one hand, Habermas claims that nature is constituted as an object by the human species' technical interest; whilst, on the other hand, he claims that this species has emerged through an evolutionary process. But if this is so, argues McCarthy, it must be possible to conceive of nature as pre-existent in relation to the human species. In other words, the naturalistic basis of Habermas's quasi-transcendental pragmatism is inconsistent with its human interest-constitutive conception of nature as the object-domain of empirical-analytic science.²⁹

My own criticism - which is, I think, compatible with McCarthy's - concerns the relationship between the empirical-analytic and historical-hermeneutic forms of knowledge, and their respective interests, technical and practical. It can be briefly stated like this. Habermas is resolutely opposed to a 'hermeneutics of nature', to a science of nature that is interpretative rather than empirical. But he insists that there is this second form of knowledge which, like empirical-analytic science, must be understood in terms of a theory of constitutive interests. In hermeneutic knowledge, though, the interest differs from the technical one; and this other, practical interest constitutes its own distinctive

object- domain of ‘meaningful’ entities. But - and this is the crucial point - if these two object-domains differ solely by virtue of their different constitutive interests (operating, presumably, upon the same uncategorized, homogeneous ‘externality’), what grounds can there be for rejecting a ‘hermeneutics of nature’, for *not* ‘choosing’ to constitute it via the practical interest? The only grounds for refusing this possibility would involve abandoning altogether the constitutive-interest doctrine. For it would have to be maintained that ‘nature’ and ‘humans’ are themselves ontologically distinct, independently of our interest-determined categorial frame works: distinctly in such a way that the application of hermeneutic categories to ‘nature’ is objectively mistaken and inappropriate.

Before developing this criticism, I must comment on a terminological difficulty reflected in my use of scare-quotes around the phrase ‘hermeneutics of nature’. For it might be said that of course such a science is impossible for Habermas since for him ‘nature’ is the object-domain constituted by the technical interest and thus cannot, logically, have the characteristics of the object-domain of a hermeneutic science, which is constituted by the practical interest. Thus a ‘hermeneutics of nature’ is logically impossible. However, what I want to explore is Habermas’s opposition to what some other theorists have claimed is possible, namely the ascription of the properties of meaning, purpose, and so on to the objects of a ‘natural science’, as in an Aristotelian cosmology. For such theorists, ‘nature’ is not defined in the way Habermas defines it. So, when I continue to refer to a ‘hermeneutics of nature’, I am using the term ‘nature’ in a non-Habermasian way. Hopefully, this will not create difficulties in understanding the objection I am presenting.

I will begin to elaborate this objection by considering some passages from Habermas which reveal the problematic features of his position. They are from papers written a few years after *Knowledge and Human Interests*, but involve no relevant departures from his views there. The first describes in summary form how the two interests constitute their respective object-domains:

In the functional sphere of instrumental action we encounter objects of the type of moving bodies; here we experience things, events, and conditions which are, in principle, capable of being manipulated. In interactions (or at the level of possible intersubjective communication) we encounter objects of the type of speaking and acting subjects; here we experience persons, utterances, and conditions which in principle are structured and to be understood symbolically. The object domains of the empirical-analytic and of the hermeneutic sciences *are based on these objectifications of reality*, which we undertake daily always from the viewpoint either of technical control or of intersubjective communication. [My italics]³⁰

And Habermas goes on to say this:

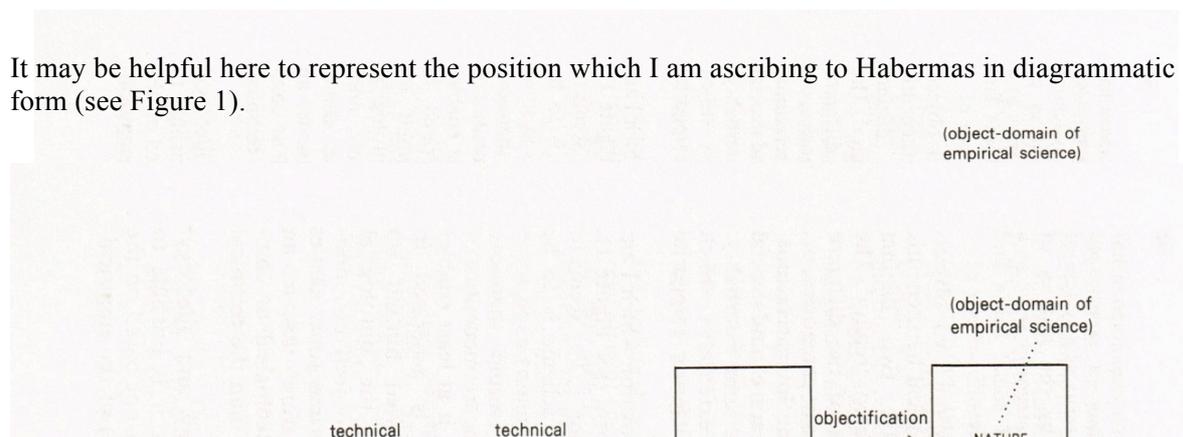
the technical and practical interests of knowledge are not regulators of cognition which have to be eliminated for the sake of the objectivity of knowledge; instead, they themselves *determine the aspects under which reality is objectified*, and can thus be made accessible to experience to begin with. They are the conditions which are necessary in order that subjects capable of speech and action may have experience which can lay a claim to objectivity. [My italics]³¹

In the next passage, Habermas presents these two forms of knowledge as based upon different interpretations of the same abstract categorial schema of space, time, substance and causality. Thus:

The interpretational schema, ‘substance’, has a different meaning for the identity of items which can be clearly categorized analytically from that which it has for speaking and interacting subjects themselves, whose ego-identity, as has been shown, just cannot be grasped by analytically clear-cut operations. The interpretational schema of causality, when applied to observable events, leads to the concept of ‘cause’; when it is applied to an association of intentional actions it leads to the concept of ‘motive’. In the same way ‘space’ and ‘time’ undergo a different schematism when viewed in regard to physically measurable properties of observable events from that which they undergo when viewed according to experienced interactions. In the first case the categories serve as a system of co-ordinates for observation controlled by the sources of instrumental action: in the latter case the categories serve as a frame of reference for the experience of social space and historical time from a subjective point of view.³²

In these passages Habermas contrasts the two object-domains of empirical-analytic and historical-hermeneutic science, and claims that they involve two distinct ‘objectifications’ of the *same* (undifferentiated) ‘reality’. The contrasting objectifications are the result of the different interests, which determine two different sets of categories, or, as he puts it in the last passage, two different ‘interpretations’ of the same categorial schema. Thus ‘nature’ and ‘social reality’ are different objectifications of the same externality: there is no distinctiveness *within* that externality which determines the appropriateness of the differing categorial frameworks.

It may be helpful here to represent the position which I am ascribing to Habermas in diagrammatic form (see Figure 1).



Now, as I noted towards the end of section 1, Fay seems to regard the question of which conceptual scheme is to be adopted in constituting different object-domains as in some way a matter of convention; and he would therefore presumably not rule out the possibility of a ‘hermeneutics of nature’. Whatever one may think of this, it at least enables him to avoid the contradiction that is generated in Habermas’s position. For, having allowed himself no philosophical space for claiming that the ontological differentiation of nature and society is objectively, non interest-constitutively based, he at the same times denies the possibility of a ‘hermeneutics of nature’ that is, an objectification of ‘nature’ (as, say, a teleological or communicative realm) by the practical rather than the technical interest.

For instance, in ‘Science, Technology and Ideology’ Habermas criticizes Marcuse’s view that it is possible to conceive of a new science and technology not based on the ‘technological *a priori*’ (Marcuse’s phrase) of the empirical-mathematical science that was first fully articulated by Galileo.³³ This new science and technology, according to Marcuse, would not be intrinsically dominative or exploitative in its conception of nature; for it would not (in Habermas’s terminology) be constituted by the technical interest. Habermas argues that Marcuse’s view is unacceptable, and says that it rests upon an error about the historical specificity of Galilean science. Whilst it is true that this empirical-analytic science is distinctively modern, arising in a particular historical situation, what is modern is only the systematization of a form of knowledge which is not historically specific, but universal to the species, being rooted in an invariant species characteristic, namely labour and rational feedback-guided activity. Thus, in an interview that took place some years after this paper, he had this

to say about Marcuse:

There are two versions of this Marcusean idea of a new science. The first, and stronger version, is that there might be a possibility to develop a type of science which is generically different from what we have now; so that due to its very structure this new science could not be applied in the exploitation of nature. This idea is a very romantic idea. I don't want to be impolite to Marcuse, but I'm convinced that this idea has no real base. The other version is that there might be a change in the relationship between the scientific system and its environment, moreover, its political environment. A change, so that in the future the developments in the science system might be stronger and stronger influenced, and after all guided by political aims and by a discursively formed, politically reasonable will.³⁴

It seems that for Habermas the only possible philosophical basis for Marcuse's romanticism would be some version of Hegelian idealism, in which there is an ultimate unity or identity of humans and nature, due to their both being different forms of objectification of the same, supra-human subjectivity. But in *Knowledge and Human Interests*, as elsewhere, he endorses Marx's materialist rejection of Hegel:

Marx, on the contrary, does not view nature under the category of another subject, but conversely the subject under the category of another nature. Hence, although their unity can only be brought about by a subject, he does not comprehend it as an absolute unity. The subject is originally a natural being instead of nature being originally an aspect of the subject, as in idealism. Therefore unity, which can only come about through the activity of a subject, remains in some measure imposed on nature by the subject. 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, Ernest Bloch, Herbert Marcuse, Theodor W. Adorno) find themselves attracted by this heritage of mysticism. Nature does not conform to the categories under which the subject apprehends it in the unresisting way in which a subject can conform to the understanding of another subject on the basis of reciprocal recognition under categories that are binding on both of them.³⁵

Now were one to read this passage without knowing of Habermas's interest-constitution theory, it would be quite natural to assume that Habermas here endorses a dichotomy between subject and object - and hence, between a science of the subject and a science of the object - which is 'objective' in the sense that it is not itself solely a product of two divergent objectifications of an uncategorized, homogeneous externality by the human subject. But not only, I suggest, would this be the natural reading: in addition, the assumption just specified is absolutely necessary if Habermas is to be able to

reject the possibility of a Marcusean ‘resurrection of nature’ in the way that he does. But, as I have already argued, it is precisely this assumption that is denied by his theory of knowledge-constitutive interests. Thus the inconsistency at the heart of his position.

There are, of course, two possible ways of resolving this inconsistency: to deny interest-constitution, whilst preserving the doctrine of distinctive object-domains and the rejection of a ‘hermeneutics of nature’; or to preserve interest-constitution, and accept this latter possibility. One cannot be sure which option Habermas would choose, but I certainly prefer the former; and in the next section, I shall try to sketch an alternative realist account of the differentiation of scientific object-domains. But before that I will suggest two further problems in Habermas’s position, that are related to this central difficulty.

First, when Habermas went on after *Knowledge and Human Interests* to develop the concept of systematically distorted communication prefigured there in his account of Freud, he proposed that we should regard as a significant aspect of such distortion the failure to apply correctly the two interpretations of the categorial schema of space, time, substance and causality. He suggested that a typical manifestation of neurotic or psychotic disorders was the absence of recognition that the social, communicative world consisted not in causal relationships between bodies, but in motivational and intentional relationships between persons. Thus, immediately preceding the passage I quoted above concerning the two interpretations of the categorial schema, Habermas says, in the course of listing a number of features that distinguish normal from distorted communication:

Finally, normal speech is distinguished by the fact that the sense of substance and causality, of space and time, is differentiated according to whether these categories are applied to the objects within a world or to the linguistically constituted world itself which allows for the neutrality of speaking subjects.³⁶

But surely this criterion of distortion presupposes the possibility of a correct and ‘objectively’ based way of making the differentiation which in pathological conditions is confused? Yet if my previous argument is correct, the theory of interest-constitution does not allow this possibility.

However, this ‘mistake’ made within distorted communication is not as straightforward as so far indicated. For in the pathological condition one’s own actions and communications do not appear to be immediately intelligible in terms of conscious motives and meanings. As Habermas argues in his account of Freud in *Knowledge and Human Interests*,³⁷ distorted action and communication are under the control of unconscious motives and symbolic disguises, and they thus appear, both to the agent and the observer, as belonging to the ‘natural’ realm of non-intentional causality. This appearance is

both revealing, for the reasons just mentioned, but also misleading since, according to Habermas, such actions belong to the realm not of causality, but of quasi-causality (the causality of ‘fate’ or ‘second nature’, following Habermas’s use of Hegel’s and Lukacs’s terms), from which they can be ‘rescued’ through a self-reflective therapeutic process guided by a critical social theory.³⁸ And this is why Habermas claims that:

In the methodically rigorous sense, ‘wrong’ behaviour means every *deviation from the model of the language game of communicative action*, in which motives of action and linguistically expressed intentions coincide This model, however, could be generally applicable only under the conditions of a non-repressive society. Therefore deviations from it are the normal case under all known social conditions.³⁹

As is clear from other contexts, Habermas wishes to employ the concept of distorted communication and the conditions for its elimination to features of social relationships that go well beyond the area of individual psychopathology. The Marxist concept of ideology, for instance, is given a similar analysis, and the critique of ideology is seen as methodologically analogous to the therapeutic ‘critique’ of neurosis.⁴⁰ Indeed, consistently I think with Habermas’s position here, we might analyse the concept of reification as involving a combination of the ‘revealing’ and the ‘misleading’ similar to that presented above. Thus, reified social relationships appear as relations between things. They in fact are not, but equally, neither are they immediately intelligible relationships between autonomous subjects. And this is why a purely hermeneutic social science is inadequate, and must be replaced by a critical social theory which both detects, and aids in overcoming, their quasi-causal character, so ushering in the non-repressive social order of autonomy and intelligibility.

But (and here I introduce the second of my two further points) the possibility of discriminating between causal, quasi-causal, and hermeneutically intelligible relationships surely presupposes that the differentiation of these object-domains is not determined by the operation of different constitutive interests. For if it were, there could be no basis for criticizing those forms of social science that depict their ‘objects’ as either ‘fully natural’, or ‘fully intelligible’; that is, for criticizing the inadequacy of both positivist and hermeneutic social science to deal with object-domains involving distorted communication and action - neurosis, ideology, and so on. It is only if an objectivist, realist alternative to Habermas’s quasi-transcendental pragmatism is provided that precisely these aims can (as they should) be achieved by a critical social theory.

In the next section, I sketch the beginnings of such an alternative. But before this there is one more comment to make about interest-constitution. Habermas and several of his commentators have noted that there are

various a-symmetries between the functions of, on the one hand, the technical and practical interests, and on the other, the emancipatory interest.⁴¹ I suggest that one a-symmetry is that the latter cannot be constitutive of its object-domain in the way that the two former interests are. For the emancipatory interest does not constitute the object-domain of distorted communication. If anything, it aims at ‘constituting’ undistorted communication. But here of course the sense of ‘constitution’ is quite different: critical social theory, guided by the emancipatory interest, aims at the realization of undistorted communication, and at the elimination of the distorted object-domain that it investigates. Thus the emancipatory interest is not ontologically constitutive, in the way that the technical and practical interests are supposed by Habermas to be. However, if my argument in this section is correct, the emancipatory interest cannot have this function if the other interests *are* ontologically constitutive. For if this were so, the objective character of distorted action and communication, and the consequent inappropriateness of either positivist or hermeneutic social science, could not be recognized - just as, if his theory of constitutive interests were accepted, the inappropriateness of a hermeneutic science of nature could not be demonstrated.

4. Humans, nature and human nature

I have argued that Habermas cannot consistently maintain both the theory of constitutive interests, and the denial of a hermeneutics of nature. I now wish to challenge the adequacy of his basic contrast between the two object-domains of nature, and human or social reality, with these no longer seen as constituted by different interests, but as interest-independently distinct domains. The dichotomy is, I suggest, mistaken in two ways. First, Habermas’s characterization of nature conflates a number of significantly different non-human domains. Second, the contrast is specified in a way that prevents a proper conception of the human species itself, in effect ‘de-naturalizing’ it. As an alternative to Habermas’s ontology I will outline a position that recognizes both a diversity of non-human forms of being, and important continuities between some of these and human being.

Habermas’s conception of the object-domain of empirical-analytic science is, I think, appropriate only to inorganic nature, and takes no account of the distinctive features of the (various kinds of) ‘objects’ of the life-sciences. There is thus a gap in his ontology, between nature as he characterizes it, and the human realm of meanings, communicative activity, etc. What is missing are the various types of organic objects whose properties and appropriate modes of investigation and explanation differ from those of inorganic entities. In other words, the object-domains supposedly constituted by the technical and practical interests are not exhaustive of what there is in the world.⁴²

Within the realm of organic objects we can make a number of significant differentiations based upon the presence or absence (either singly or in certain combinations) of the following properties: (1) goal-directedness; (2) experience; (3) purposiveness; and (4) communication. These properties are not the

only possible bases upon which such differentiations may be made; and further distinctions may usefully be drawn within each of them. But my account here is intended only as a schematic outline.

First, a few comments about each of these properties. I take goal-directedness as a more extensive concept than purposiveness, though unfortunately there is no established terminology to indicate this in the literature on teleology. Thus, goal-directedness includes all functional concepts within the life-sciences involved in claims such as ‘the kidney’s function is to aid excretion’, or ‘the heart’s function is to circulate the blood’; and also the homeostatic concepts involved, for instance, in characterizations of the internal temperature-maintenance systems of warm-blooded organisms: here, the concept of negative feedback control is central.⁴³ I take it that, in all cases of organic goal directedness, we can normally relate the functions directly performed to the more general functions of life-maintenance and reproductive success, and thus to the fundamental goal- concepts of evolutionary theory. I assume also that a distinction can be drawn between the kinds of teleological concepts so far mentioned, and the concept of purposive activity, of which at least the central cases involve some form of conscious deliberation; but I am not sure whether, for instance, apparently largely innate behavioural patterns such as the nest-building activities of birds, should be classified as fully purposive, or merely non-purposive but goal-directed.⁴⁴

The concepts of experience, and of communication, are perhaps most in need of further internal differentiation. I take the former to include perceptual experience (as distinct from a purely behaviourally defined reactivity to sensory stimuli); bodily sensations or feelings such as pain, nausea, or hunger; and the emotions, such as fear, anger, elation, embarrassment, or jealousy. Both the nature of, and the relations between, these different types of experience are complex; but I will confine myself to just a few comments. First, at least some emotions seem to involve associated bodily sensations - for instance, fear and anger. Second, I assume that species differ in the ‘range’ of experiences they are able to have: for instance, some may experience bodily sensations such as pain, but not emotions such as elation. Third, there may be important differences between kinds of emotion, especially between those that do, and do not, involve cognitive elements (of varying degrees of sophistication). Thus jealousy, for example, is an emotion associated with quite complex beliefs; whereas fear is not, at least not necessarily. Finally, it seems likely that in species which have the cognitive capacities for emotions such as jealousy, the character of the experiences they ‘share’ with other species that lack these capacities is thereby altered. Thus primate-fear may differ from bird-fear, just because of the further capacities of primates that enable them, unlike birds, to experience embarrassment.⁴⁵

As for communication, this is also a difficult concept to specify adequately. There are definitions that seem far too extensive, such as ‘the transmission and reception of information’. This definition has the

consequence of making, for instance, any type of perceptual interaction between environment and perceiver count as ‘communication’. Other definitions appear too restrictive, for instance those which require some conscious intention on the part of the ‘information-transmitter’ (which would probably rule out cases such as bird-calls or bee-dances), or which specify the features which are *peculiar* to human linguistic communication as necessary conditions for *any* kind of communication. I am inclined to follow writers such as Hockett and Thorpe who attempt to identify *all* the characteristics of human linguistic communication, and thus enable comparisons to be drawn between the particular forms of communication in different species, including humans.⁴⁶

The list of properties I have given is intended to be seen as hierarchically ordered, in that each successive property in the list requires, but is not required by, its predecessor. Thus, goal-directedness may exist without communicative capacities, but not vice versa. I am least confident of the ordering of communication and purpose, partly because of the difficulties just noted about their definition. Further, as I pointed out in the case of experience, the presence of a higher-order capacity may typically alter the character of a lower-order capacity. Other examples of this would be the (highly complex) relationship between perceptual and communicative properties (for instance, the role of linguistic concepts in the processing of sensory information); and the effect of conscious-purposive capacities in altering or controlling instinctual goal-directed patterns (such as sexual or reproductive activity).⁴⁷ Finally, I assume also that the hierarchical ordering roughly maps onto the historical process of organic evolution, in that ‘higher’ corresponds typically to (temporally) ‘later’. But I do not thereby endorse a corresponding order of normative value, or an ‘evolutionary ethics’. Such normative positions must be based on the explicit adoption and justification of anthropocentric values, and cannot be derived solely from evolutionarily defined hierarchies.

In saying that this list of properties enables us to differentiate, objectively, various kinds or levels of organic object-domains, I am denying the legitimacy of certain kinds of *reductionism*. I do not think it is possible to perform a *conceptual* reduction of these properties to the properties of inorganic entities: that is, to define the former in terms of the latter. But this does not rule out the possibility of an *explanatory* reduction, in which laws or theories at higher levels (involving level-distinctive concepts) are explained by reference to laws or theories of lower levels. That is, one can deny the possibility of inter-level translation or definition of concepts, whilst not denying the existence of a-symmetries between the explanatory power of theories at different levels.

Further, I think the kind of conceptual irreducibility that exists, here, is incompatible with an *ontological* reduction, according to which the terms of the higher-level theories are said to in fact refer only to the entities specified in the lower-level theories. Although some cases of conceptual non-translatability are consistent with extensional, and thus ontological, identity (for instance, the much-

loved ‘The Morning Star is the Evening Star’), I do not think the same extensional identity can exist between the concepts involved in describing, say, perceptual experience or bodily sensations, and those involved in describing neurophysiological states. But this is compatible with regarding neurophysiological states as explanatory with respect to perceptual experience or bodily sensations.⁴⁸

This completes my account of how an ontological plurality of various kinds of organic and inorganic beings should replace Habermas’s conception of the object-domain of empirical-analytic science. If this pluralism is accepted, at least in outline, this would strengthen my arguments against his interest-constitution theory. For the theory would then require the identification of a multitude of different interests, one for each object-domain; and there would be no interest-independent basis for ‘choosing’ one such interest rather than another to perform a constitutive function.

I will now consider how this proposed internal differentiation of the concept of nature into inorganic and (various kinds of) organic object-domains may affect our understanding of the second element in Habermas’s dichotomy, the domain of human social reality. Here I think we should adopt an evolutionary perspective which requires recognition both of the *distinctive* characteristics of each species, and also of their *relatedness* to one another through the historical processes of speciation, whose explanation involves focusing upon how the characteristics of different species are adaptively related to their environments. Habermas (along with many other theorists) is, I suggest, inclined to regard ‘human nature’ as consisting only in those features which *distinguish* this species from others. Instead, we should regard the central features of the human species - as of any other - as including also those that it has in common with others: in particular, with its evolutionary relatives (the species which either are, or share, ancestors). In the evolutionary process there are no complete discontinuities, and one should therefore be suspicious of ontological dichotomies which appear to deny this. Human society is not a gift from God.

For instance, it is probably true that human language is significantly different from all other animal communication systems. But it does not follow that we *are* ‘linguistic beings’: that is, no more (or less) than this. Nor does it follow that human communication involves *only* this species distinctive linguistic character; and (despite certain qualifications) studies of human non-verbal communication strongly suggest continuities in this respect with features of non-human primate communication, for example in the facial expression of emotion.⁴⁹ Nor, from the fact that learning and conscious-purposive activity have, in humans, species- distinctive features, does it follow that there are no innate components in human ontogeny that are related to this species’ evolutionary past. ‘Human nature’ includes non-human ‘nature’.⁵⁰

However, whilst emphasizing that species-nature is not the same as species-distinctive nature, we must not make the mistake of regarding the nature of the human species as a simple combination of distinctive and non-distinctive features. That is, it is not a matter of the conjunction of a number of such characteristics: say, experience + purpose + non-verbal communication + learning + language. For typically, the evolutionary emergence of higher functions affects the character and mode of operation of the lower functions which are continuous with those of evolutionary ancestors. For instance, in humans the evolutionarily ‘old’ limbic system in the brain, important in emotional activity, is connected in complex ways with evolutionarily ‘recent’ components.⁵¹ This is why even those emotions which we to some extent share with other species may take a different form in humans. (And that is one important reason why the practice of direct chemotherapeutic or surgical intervention in the human limbic system, for instance in amygdalotomy, is misconceived not only in moral and political terms, but also ontologically.)

This last point raises the question of the relationship between a proper understanding of the nature of human beings and the normative issues involved in practices aimed to change the character of their activities, which will be taken up again much later.⁵² But before that we need to examine the claims made for a kind of science which, according to Habermas and other critical theorists, is distinct from both empirical and hermeneutic sciences in its object-domain and criteria of validity. It is a science guided by the emancipatory interest in human autonomy, which is intended to aid its ‘objects’ in freeing themselves, through a self-reflective process, from patterns of distorted communication and activity. I turn now (in chapter 5) to consider Habermas’s account of this.

Notes and references

1 Jürgen Habermas, *Knowledge and Human Interests*, trans. J. J. Shapiro, Heinemann 1972, p.307.

2 Brian Fay, *Social Theory and Political Practice*, Allen and Unwin 1975, ch. 2.

3 See ch. 1, sec. 2, above.

4 Carl G. Hempel, *Aspects of Scientific Explanation*, Free Press 1965, p.367.

5 Fay, *Social Theory*, p.35.

6 *Ibid.*, p.39.

7 Hempel, *Aspects of Scientific Explanation*, p.374. See also Russell Keat and John Urry, *Social Theory as Science*, Routledge 1975, pp.11-13 and 27-32.

8 See ch. 1, sec. 2, above; and Keat and Urry, *Social Theory as Science*, pp. 63-4.

9 Fay, *Social Theory*, p.40.

10 Ibid., p.41.

11 Ibid., p.40, footnote 28.

12 E.g. Hans Albert, 'The Myth of Total Reason', pp.170-71, and 'Behind Positivism's Back?', pp. 240-2, in G. Adey and D. Frisby eds, *The Positivist Dispute in German Sociology*, Heinemann 1976, and Nicolai Lobkowitz, 'Interest and Objectivity', *Philosophy of the Social Sciences* 2, 1972, pp. 193-210, p. 204.

13 E.g. Jürgen Habermas, 'A Positivistically Bisected Rationalism', pp. 207-9, in G. Adey and D. Frisby eds, *The Positivist Dispute in German Sociology*, Heinemann 1976, pp. 198-225, and 'A Postscript to *Knowledge and Human Interests*', pp. 179-82, *Philosophy of the Social Sciences* 3, 1973, pp. 157-189.

14 I will discuss this theory in ch. 6, sec. 2, below.

15 E.g. in his comments on dispositional properties in *Human Interests*, pp.129-32, and 'A Positivistically Bisected Rationalism', p.209, footnote 12.

16 Habermas, *Human Interests*, chs. 1-3.

17 Ibid., p.33: strictly, this is Habermas's account of Marx's view, but he clearly endorses it here.

18 Ibid., p.35.

19 Ibid., p.28.

20 Cf. G. A. Cohen, 'Marxism: A Philosophy of Nature?', *Radical Philosophy* 2, 1972, pp. 28-31.

21 Habermas, *Human Interests*, p.34.

22 Ibid., p.35.

23 Habermas, 'Postscript', pp.171-2.

24 Habermas, 'On Systematically Distorted Communication', p. 212, *Inquiry* 13, 1970, pp. 205-218; see the further discussion of this in sec. 3 below.

25 See ch.1, sec. 2, above.

26 See David Bohm, *Chance and Causality in Modern Physics*, Routledge and Kegan Paul 1957, chs. 3-4, and W. Heisenberg, *Physics and Philosophy: The Revolution in Modern Science*, Allen and Unwin 1975.

27 See, e.g., P. F. Strawson, *The Bounds of Sense*, Methuen 1966, Part Four.

28 See Thomas McCarthy, *The Critical Theory of Jürgen Habermas*, Hutchinson 1978, pp. 291-310.

29 Ibid., pp.110-25.

30 Jürgen Habermas, *Theory and Practice*, trans. J. Viertel, Heinemann 1974, p.8.

31 Ibid., p.9.

32 Jürgen Habermas, 'On Systematically Distorted Communication', p.212.

33 See Herbert Marcuse, *One-Dimensional Man*, Routledge and Kegan Paul 1964, ch. 6; Jürgen Habermas, 'Science, Technology and Ideology',

34 Boris Frankel, 'Habermas Talking: An Interview', p.46, *Theory and Society* 1, 1974, pp. 37-58.

35 Habermas, *Human Interests*, pp.32-3. Cf. Lucio Colletti's criticisms of Marcuse's Hegelianism, in *Marxism and Hegel*, New Left Books 1973, chs. 4, 5 and 9.

36 Habermas, 'On Systematically Distorted Communication', p.212.

37 Habermas, *Human Interests*, chs. 10 and 11.

38 I borrow the term 'quasi-causality' from Fay, *Social Theory*, pp. 84-5, but use it in a somewhat different sense, as a shorthand for Habermas's terminology, the meaning of which will be explored in ch. 4, sec. 2, below.

39 Habermas, *Human Interests*, p.226.

40 E.g. Habermas, *Theory and Practice*, pp.25-32. On the concepts of ideology and reification, see, e.g., Keat and Urry, *Social Theory as Science*, ch. 8.

41 See, e.g., McCarthy, *Habermas*, pp.92-4.

42 However, see Jürgen Habermas, *Communication and the Evolution of Society*, trans. T. McCarthy, Heinemann 1979, pp.131-42, for an implicit modification of his earlier dichotomy. On the general differences between the organic and inorganic, see M. Beckner, *The Biological Way of Thought*, University of California Press 1968, chs. 1, 2 and 9; and W. H. Thorpe, *Animal Nature and Human Nature*, Methuen 1974, ch. 1.

43 On the concepts of teleology and function, see Beckner, *The Biological Way of Thought*, chs. 6 and 7; and on negative feedback, see Keith Oatley, *Brain Mechanisms and Mind*, Thames and Hudson 1972, ch. 7.

44 On innate patterns of 'purposive' behaviour in animals, see S. A. Barnett, 'Instinct' and 'Intelligence', Penguin Books 1970, ch. 10; and Thorpe, *Animal Nature and Human Nature*, ch. 4.

45 For discussions of the (numerous) different conceptualizations of emotion, see M. B. Arnold, ed., *Feelings and Emotions*, Academic Press 1970; and W. Lyons, *Emotion*, Cambridge University Press 1980.

46 See the various contributions in Part A of R. A. Hinde, ed., *Non-Verbal Communication*, Cambridge University Press 1972, where these definitional issues are examined.

47 I return to some of the issues in ch. 4, sec. 4, below.

48 These different kinds of reduction are discussed more fully in ch. 4, sections 4 and 5, below.

49 See, e.g., Paul Ekman, ed., *Darwin and Facial Expression*, Academic Press 1973.

50 So in general terms I am sympathetic to the approach advocated in Mary Midgley, *Beast and Man*, Harvester Press 1978, especially chs. 10-13. But cf. the comments on innateness in ch. 4, sec. 4, below.

51 See, e.g. Steven Rose, *The Conscious Brain*, rev. edn, Penguin Books 1976, chs 6 and 10.

52 See ch. 6, sec. 1, below.