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Reductionism in Social Science

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Introduction

Broadly speaking, 'reductionism' is used in philosophy to refer to doctrines according to which one can explain some object by reducing it to a different, usually more simple, level – for example, the meaningful to the physical as in behaviourism, knowledge to sense data as in phenomenalism, the social to the biological as in sociobiology. The reductions are not made merely as a way of simplifying complexity, but of locating what their advocates believe to be the causes or sources of the explananda. Anti-reductionists argue that the explananda are irreducible, that even though they may depend on the things to which reductionists appeal - thought on brain cell activity, for example - they have *emergent properties* or powers which cannot be reduced to those of their constituents without residue. Anti-reductionists therefore argue for a *stratified ontology*, in which any higher stratum presupposes lower strata but not vice versa – as in the asymmetric relation of the biological to the physical. The strata usually cited are the physical, the chemical, the biological and the social, but further strata may be invoked within each of these. The plausibility of the idea that the world is stratified arguably provides a warrant for the existence of different disciplines: the physical, the chemical, the biological and the social deal with different strata of reality. However, as we shall see, the subdivision of social science into disciplines has a much less clear relation to stratification. In part, the rise of different social sciences seems to correspond to the differentiation of spheres in modernity – politics, law and economics, for example - rather than to different strata, though some might argue that psychology is an exception.[1] A third group argues against both these positions, arguing that all objects and processes are on the same level within a relational field, and that what eventuates are products of interaction rather than emergence.

In social science, the term 'reductionism' is used largely pejoratively, as in the accusation of 'biological reductionism' or 'psychologism' used by sociologists against those who seek to explain social behaviour in biological or psychological terms. It is often used with reference to stratification and emergence held to exist within the stratum of the social, as in accusations of 'vulgar materialism', where actors' beliefs are treated wholly as a function of their material circumstances. Some arguments about reductionism centre not on reduction as such – though they may claim to do so - but the form and direction of the reduction. For example, some opponents of the reduction of the social to the biological may advocate not a stratified ontology in which the social has irreducible emergent powers from the biological, but in effect that the biological is reducible to the social or cultural. In other words an upwards reduction may be substituted for a downwards reduction. Upward reductions have become common with the rise of cultural studies and the prioritisation of discourse. Support has also grown in some parts of social science, particularly anthropology, for the third, 'flat ontology' position (e.g. Ingold, 2000).

There are also looser usages of the term, again invariably pejorative, which refer not to the reduction of higher strata objects or processes to lower strata ones (or vice versa) but simply to reductions the explanations of multiply determined processes to a few elements, ignoring others within the same stratum that are believed to be significant. (These might be called horizontal reductionism). The reduction of capitalism to market exchange might be an example of this. For advocates, such reductions provide a way of simplifying and clarifying what they claim would otherwise be unmanageably complex, and they may invoke the prerogative of scientific abstraction and the ideal of explanatory elegance and parsimony to legitimate this. For critics, they involve misattributions of causality and misinterpretations of the meaning of discourses. Thus, for example, the reduction of capitalism to exchange might

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[1] I have argued elsewhere that while the disciplinary divisions of natural science have an ontological rationale, those of social science do not and should be replaced by a postdisciplinary social science (Sayer, 2000).

be argued to allow the effects of power imbalances in control over key resources to be attributed to free exchange.[2]

This last example indicates that reductionism is not merely an arcane matter internal to scientific and philosophical inquiry and lacking wider interest. Reductionism is common in everyday thought and discourse, and it can take forms which have great political significance. Thus, attributing people's behavioural characteristics in reductionist fashion to their genes has important implications for how we evaluate them and respond to them. Stances on reductionism underlie whether we respond to behavioural pathologies by administering drugs or providing therapy and changing the social environment. Individualistic explanation is a particularly important form of reductionism: by reducing the social to the individual, it attributes to individuals sole responsibility for their fates, so that, for example, individuals are solely responsible for their class and life chances. This is mirrored by a form of sociological reductionism in which individuals have no influence or responsibility for their actions or character and are merely products of wider forces, intersections in discursive networks, etc. These two opposed reductionisms, albeit in more moderate forms, are fundamental to the political divide between right and left. As is usual with reductionism, it is easier to identify the problems of such positions than how to resolve and avoid them.

In this critical commentary on reductionism I shall include both the more technical and looser senses of reductionism, for both cover matters of considerable political significance, though I shall focus mainly on vertical reductionism. Although I'm interested in reductionism primarily as an issue in the social sciences, given the importance of relationships between the social and the biological and the physical, it would of course be reductionist (in a pejorative sense) to ignore these. It is also difficult to say much about reductionism without straying into matters of dualism, but I assume that in this context this should be a productive.

Any general position on reductionism implies some kind of wider philosophical standpoint regarding ontology and metaphysics, in terms of which more specific arguments about reductionism, explanation and interpretation are developed. It is therefore necessary to give some background on this standpoint, which derives in my case from critical realist philosophy. This opposes reductionism and supports a stratified ontology in which emergent powers figure prominently. The main part of the paper develops this approach, offering explanations of emergence, critiques of reductionism and flat ontology positions, and discussions of the implications of interaction among mechanisms at different strata. The second part discusses some influential forms of reductionism in social science - strong social constructionism and its essentialist 'other', the reduction of actors to causal agents and meaning makers, reductionist approaches to values and reason produced by the fact-value family of dualisms, and finally, and briefly, reductionist treatments of responsibility, whether individualist or socially determinist. But before launching into this there is a preliminary matter which must be dealt with – the influence of rivalries between academic disciplines and their imperialistic tendencies in driving reductionism.

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[2] Often it is difficult to decide whether the reduction is horizontal or vertical: the problem of class reductionism, for example, could be viewed as a form of horizontal reduction, ignoring influences such as those of gender and ethnicity, but which perhaps exist on the same level as class, or alternatively, as reducing things which are emergent from class, as reducible to it.

Preliminaries: Disciplinary imperialism

The issue of reductionism, of whether one kind of view of the world can be reduced to (and hence replaced by) another without loss, throws different kinds of knowledge into competition, whether for the same ground or over an appropriate division of territory. Raising the issue invites not only debate but competition among disciplines, and hence is liable also to invite that most tedious of academic tendencies - disciplinary imperialism (Sayer, 2000a). Disciplinary imperialism is itself a form of reductionism, at once both imperialistic and parochial, claiming ever greater scope and vision for a particular discipline while remaining within its restricted point of view. The shackling of individual academic ambition to the fortunes of institutionalised disciplines produces claims from each discipline that it is more fundamental and/or comprehensive, than any other discipline. Given disciplinary imperialism, one is tempted to say that economists would say that everything can be reduced to a matter of choice, wouldn't they? - just as anthropologists would attempt to say everything is cultural, and sociologists would claim that everything is socially-constructed. Particularly between disciplines which are close or overlapping in their objects one finds not only competition but mutual aversions, such as those of sociology and psychology or economics and sociology. These are evident in sociologists' fear of being accused by colleagues of 'psychologism' (reduction of the social to the psychological), which tends to make them refuse to concede anything to psychology, even where doing so would help their own explanations. It is also evident in economists' scarcely-veiled contempt for sociology, often buttressed by the curious claim that sociologists deal with the irrational and economists with the rational aspects of behaviour (which can hardly escape a corresponding implied inequality in status), and by a methodological imperialism which considers deductive reasoning, preferably in mathematical form, as the only kind of approach that warrants the honorific label 'scientific'.

Disciplinary imperialism invites members of disciplines (who are more 'the disciplined' than 'the disciples') to assess theories or explanations not according to any general standards of empirical adequacy, rigour, coherence, etc., but according to whether they advance the imperialistic ambitions of their discipline. Of course, they rarely do so deliberately; rather they respond to the positive incentives to do so in terms of their personal reputation and that of their discipline, while the arguments of the natives who are being displaced are unlikely to be understood or taken seriously, since they come from another discipline. Individual academics can advance their careers by showing that what was previously imagined to lie outside their discipline's territory can in fact be better explained by their own discipline's tropes and theories. Public choice theory in economics, which claims to be able to explain any social behaviour, not just that generally seen as economic, in terms of the supposedly rational choices of narrowly self-interested individuals, is just one example. Sometimes, of course, they may be right; this is not a defence of existing disciplinary boundaries – far from it - but a warning of the dangers of such explorations being conducted in a spirit of disciplinary imperialism rather than postdisciplinary learning.

One doesn't have to fall for a sociological reductionism to acknowledge that the competitions of the academic field for status and power so brilliantly analysed by Pierre Bourdieu in *Homo Academicus* (Bourdieu, 1988) has something to do with the way debates about reductionism and the relation of different kinds of discipline, explanation and theory develop in the context of a field of competing actors and institutions. As Bourdieu argued, the point of acknowledging such tendencies is not to invite a sociologically imperialist reduction of the structure and content of knowledge to a competition for power among academics, but precisely to identify, and hence to limit, the distortion of our understanding of the world by that form of institutionalised competition (Bourdieu, 2004).

A Critical Realist view of reductionism, stratification and emergence

The ontological and metaphysical bases of my argument come from the philosophy of critical realism, pioneered by Roy Bhaskar (1975; 1989), and developed most in relation to reductionism by Margaret Archer (1995; 1996; 2000; 2003). This is a fallibilist, post-positivist philosophy, which regards both causal explanation and interpretive understanding as necessary for social science. It is anti-reductionist, arguing that the world is stratified and characterized by emergence. Thus, the meaningful character of discourse or communicative interaction is emergent from rather than reducible to physical behaviour, and hence must be understood 'at its own level', through verstehen or interpretative understanding. Critical realism's distinctive analysis of causation is particularly important for dealing with reductionism, and it is therefore necessary to explain this briefly before proceeding.

The production of change (which is all we mean by causation[3]) cannot be understood by treating it in the conventional manner as a matter of regular successions of events in which event C is regularly followed by event E. Not only does this Humean or successionist theory of causation simply fail to explain what makes such things happen (indeed it merely formalises what we probably already know and what needs explaining), but its focus on empirical regularities in events renders qualitative change and novelty unintelligible. Stable, precise, empirical regularities depend on objects being internally stable and set within invariant contexts. Such conditions rarely occur spontaneously and generally have to be worked for through the construction of machines and ordering structures in social life generally, and through the construction of experiments in science in particular.[4] In view of this, the world must be open, capable of many possibilities, not following a pre-determined course. Rather causation is a result of the causal powers and susceptibilities of things (including relationships), such as the power of people to reproduce, inflict violence, or to converse and reflect. The existence of particular powers (susceptibilities) depends on the structure of the objects bearing those powers, such as the neurophysiological conditions of communicative interaction, and often on wider relations or structures or fields in which they are situated, such as language communities. However, these powers are not necessarily activated or exercised, for whether they are depends on contingently related circumstances, and the causal powers and susceptibilities of those circumstances. They exist even when they are not being activated, as in, for example, the powers of an army during peacetime, or the labour power of unemployed workers. If and when they are activated, the particular consequences that flow from it depend on the mediation, (reinforcement, deflection, transformation or blocking) of the process by these latter contextual, causal powers and susceptibilities. Hence causation cannot be understood as a unilateral process in which some agents or things produce certain kinds of change, regardless of the nature of the things on

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[3] I add this point because in actor network theory and some regions of cultural studies it is imagined that we can dispense with any concept of cause in accounting for phenomena. Such a view is untenable in the strong sense as we have to contradict it as soon as we have to offer any explanation of what produces a particular change, such as a change in what people believe and how they behave. Sometimes the attempt to reject causation seems to be based on the belief that causal explanation is about discovering single original causes or founding moments (which would clearly be reductionist); most changes of interest to the social sciences and humanities have multiple causes, and evolutions, and their explanation does not require an infinite regress. Power in the Foucauldian dispersed sense is only intelligible as the sum of the exercise of the causal powers of all the objects in a particular field (Sayer, 2004).

[4] This work generally requires attempts to purify substances and processes, which otherwise are normally characterised by variation, albeit to varying degrees. As Dupré, argues, contrary to atomism, this variability appears to 'go all the way down' (Dupré, 2002).

which they are acting. Thus the reception of this article depends not only its content and my circulation of it, but on you the readers' prior dispositions and understandings.

Causation, then, is to be understood in terms of powers, which may exist even when not being exercised. Critical realism therefore rejects 'actualism' – which reduces causation to interaction or the exercise of powers, without explaining what those powers are or from which they derive – though this is a common form of reductionism in social science, indeed it is central to approaches as different as positivism and actor network theory.[5]

The production of change is thus always two-sided, dependent not only on the nature of the causal agent as it were, but also on the things which activate its powers and mediate its operation and effects. It may be helpful here to use the analogy of shaping. When we shape something, what happens depends not only on the tools we use but the properties of the object we are trying to shape. Thus wet snow is easier to mould than dry snow because its internal structure offers more resistance. A one-sided view of this causal process which ignored this would be reductionist in a pejorative sense because it would misattribute what is due to the object being shaped to the shaping agent.

Now before going further, I want to deal with a common, disarmingly simple defence of reductionism which appeals to the unavoidability of simplification: the world is complex and since we have always to simplify to understand it, reductionism should be seen less as a problem than a solution. On this view, anti-reductionism might be seen as implying a reactionary opposition to the usual methods of selection, abstraction, and simplification that science, and indeed any kind of study, involves. Thus reductionism is often justified by reference to the methodological ideal of parsimony and elegance in explanation. This ideal is most appealing in mathematics but less so in substantive disciplines dealing with causal processes. It is often coupled to instrumentalist models of explanation which take it to be reducible to a matter of calculation and prediction, where explanation is simply 'postdiction' of events, and is assessed in terms of how much of the variation of y is 'explained' (i.e. can be calculated) by a formula incorporating other measurable variables.[6] In mainstream economics the criterion of parsimony tends to be invoked as a way of buttressing the reductive accounts produced by its own disciplinary imperialism, so that when the reduction of the determinants of action to self-interested rational choice is questioned in terms of its explanatory adequacy or plausibility and charged with misattribution of causal responsibility, it is defended in terms of its simplicity and elegance, and also the scientific licence to abstraction ('we proceed by the power of our abstractions').[7] Such an approach confuses questions of how quantitative variation in one variable is quantitatively related to that in certain others with the causal

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[5] In sociology it takes the form of interactionism, in which action or practice is explained without reference to the properties of structures or fields (see Bourdieu's critique of interactionism in understanding markets (Bourdieu, 2005)). This may be coupled with a flat ontology in which structure and agency are conflated and stratification and emergence are denied (Archer, 1995). Archer terms this 'central conflation', in contrast to 'downward conflation' (treating agency as epiphenomenal and collapsing it into structure) and 'upward conflation' (treating structure as reducible to individual agency).

[6] It is often also coupled with an instrumentalist rejection of the concept of truth, according to which we hold certain beliefs, theories, etc, not because they are true but because they are useful. This may sound appealing, until one asks whether we believe that 6 million died in the Holocaust because it's useful to do so or because we think it's true.

[7] Some critics of mainstream economics argue that its insistence on retaining its restrictive assumptions and abstractions is driven by its fetish of mathematical formulation of solubility; any assumptions which cannot provide the basis of analytically soluble models are rejected out of hand regardless of their explanatory power (Fleetwood, 1999; Lawson, 2003).

question of what makes something happen. In other words it mistakes calculation for explanation, or the things of logic for the logic of things. More broadly it commits the 'epistemic fallacy of confusing questions of knowledge with questions of being, as if what happened in the material world depended how we think about it (Bhaskar, 1975). Logic deals with relationships between statements, not things: causation concerns processes and transformative relationships between things (Harré, 1970; Sayer, 1992). Implicitly, such an approach assumes closed systems lacking novelty and emergence. On this criterion, a prediction or postdiction based on simple curve-extrapolation involving no model of causal mechanisms and how they work or of substances and structures is preferable to an approach which does attempt to provide such models and accounts. The ideal of parsimony is problematic where it is taken to trump the criterion of explanatory adequacy, so that inferior explanations are preferred on the grounds that they are simple and elegant, even though they fail to resolve problems explained by more complex accounts. Its only defensible use in substantive sciences is as a tie-breaker where two different substantive theories appear to have equal explanatory adequacy.

This is not to reject abstraction, but rather to distinguish between the development of theory through the use of abstraction to attempt to isolate one-sided aspects of objects of interest, distinguishing them from others, and the explanation of concrete (i.e. many-sided) phenomena. The unavailability of practical experiments in social science in which abstractions can be objectified through the isolation, control and purification of processes throws a heavy burden onto abstraction and thought experiments. While these facilitate theorising the nature and properties of objects, when it comes to applying the abstractions to the explanation of concrete, many-sided situations in which there are many structures and mechanisms present, there are dangers of a kind of reductionism which mistakenly attributes to the abstracted elements effects which are actually due to things from which the researcher has abstracted, or ignores significant emergent properties of combinations of the abstracted elements (Sayer, 1992).

Downwards reductionism, stratification and emergence

In downwards vertical reductionism, higher order phenomena (for example, speaking) are treated as capable of being explained and/or predicted[8] purely in terms of lower-order phenomena (e.g. electro-chemical processes)(Bhaskar, 1975).[9] Opponents of vertical reductionism either (1) argue that lower-order processes provide a basis of contingently enabling and constraining structures and mechanisms for higher-order or emergent powers, which are irreducible to their preconditions, or (2) that all processes are 'on the same level', and that there is no stratification or emergence, only interaction. As we shall see, some opponents of downward reductionism in effect seek to replace it with upwards reductionism.

Empirically, the evidence counts against this vertical reductionism, since successful instances of such explanations and predictions have not been forthcoming, though that in itself does not discount them as a future possibility. Note that even if reductionism were successful, so that, for example, we could explain consciousness wholly by reference to neurophysiological mechanisms, it would still have to start from an understanding of consciousness, otherwise we would not know what neurophysiology was explaining, or why certain neurophysiological events were significant (Collier, 1994). This would of course leave the reality of consciousness intact and not explain it *away*. The position I wish to advocate – (1) - does not involve either an ontological reductionism (according to which higher-order phenomena are

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[8] Bhaskar separates predictive forms of reductionism from explanatory forms. I have conflated them as the differences do not bear upon my argument (Bhaskar, 1975).

[9] This possibility is assumed in the comical idea, often advanced in newspapers, that physicists are on the verge of being able 'to explain everything'.

nothing but complicated aggregates of lower-order phenomena) or an epistemological reductionism (higher-order phenomena can be explained in terms of lower-order), but is compatible with a non-reductionist stratified ontology, according to which the world is stratified into, broadly, physical, chemical, biological, social/cognitive, etc.,[10] levels, so that, for example, biological powers are dependent on but irreducible to, or more simply are 'emergent from', the chemical and physical.

The phenomenon of emergence suggests that the world is not merely differentiated but stratified; the powers of water exist at a different stratum from that of hydrogen or oxygen. Emergence can be understood as follows: Where objects are externally related and only influence each other in ways which do not alter their respective powers (merely the effects of their exercise), no emergent effects arise from their interaction. Where the interaction of objects produces changes in the structure, powers and susceptibilities of those objects, it can prompt the development of emergent powers – powers not independently or merely additively possessed by those objects. Where these are discovered, explanation of behaviour attributable to them need not involve a regress to the powers of the constituents on which they depend. By contrast, mere aggregates consist of externally-related individuals and hence lack emergent powers. Disaggregation, or reduction, as a step towards explanation of the whole, therefore presents no problem in such cases. In the case of internally-related individuals, such as where individuals relate as landlord and tenant, as specialised producers in a division of labour, or as superior and inferior, so that some of the powers and susceptibilities of the individuals are changed by the relationship, emergent powers arise, such as the development of the institution of rent and the productivity gains of division of labour. For such cases, explanation by downwards reduction fails (Sayer, 1992; Archer, 1995).

One of the most important kinds of emergence is that of semiosis – the generation of meaning from the relationships of signifiers, signifieds, referents and subjects. For the social sciences and humanities, semiosis is not only a means for understanding the world but part of the object of study. In combining words in different ways, in particular contexts, people create meanings which are not decomposable into the contributions of the individual words, because the meaning comes from the play of difference among them in relation to the context and actors (Fairclough, Jessop and Sayer, 2003).[11] These are not only emergent meanings but emergent *powers*, for they can (co-)produce novel changes in how users think and respond. Reasons and other meaningful features of discourses can be causes, not in the physical sense but as things which produce (or prevent) change. The very point of discourse is to produce some kind of effect, whether it be maintaining some situation or transforming it. Thus, for example, through neoliberal discourse, attempts are made to encourage individuals and states to see themselves as market actors, choosing what to buy or sell, rather than as citizens concerned with the public good. We need to understand both what the discourse means and what effects it produces. Social scientists don't have to choose between causation and erklären on the one hand and meaning and verstehen on the other hand: they need both (Bhaskar, 1989).

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[10] As the reader may suspect, my use here of 'social/cognitive etc' is an evasion of difficult questions regarding the status of the social, the human, the cognitive, the rational. I shall address this later, but at this point it does not prejudice the current argument.

[11] It is important not to go overboard regarding this play of difference and scope for novelty by ignoring the practical character of language and its embedding in mostly routine practice. The relationship between the words, referents and contexts and actors are mostly fairly stable, so that the meaning of particular words has at least some stability and limits as to its sense. It is hardly surprising that when language is disengaged from our practical involvements in the world and used primarily for reflection that it becomes more unstable.

This anti-reductionist view of stratification is to be preferred to the flat ontology view (2) on the grounds that the latter fails to acknowledge the asymmetric relations between strata: "One stratum ontologically presupposes another if it could not exist unless the other existed." (Collier, 1994, p.131). Culture is not ontologically presupposed by physical phenomena, though of course culture is constitutive of the science of physics;[12] e.g. all animals are composed of chemicals, but not all chemicals are parts of animals, all persons are composed of biological materials – but not vice versa (ibid. p.107). This asymmetry is also reflected chronologically, where biological organisms emerge at a late stage in the geological record, and social and cognitive processes at a still later stage. The higher strata do not break the laws of the lower strata – for example, social practices do not change gravity (Collier, 1994, pp. 46-50 and 107-136). Hence a tree does not break mechanical laws, but in addition it grows according to its biological powers which are enabled and constrained by, but not reducible to, those mechanical laws (Collier, ibid. p.119).

It is vital to note here that in distinguishing social, biological, etc strata, we are indeed identifying objects or processes by their distinguishing characteristics only, ignoring what they have in common. Thus biological organisms also have chemical and physical characteristics, and as social beings we are also biological, chemical and physical beings and what we can do depends on all these levels, both through the non-reductive dependence of the social on these successive levels, and through our physical, chemical and biological processes. It is therefore an error to suppose that social phenomena are governed only by social processes (contra Durkheim's sociological imperialism[13]), biological only by biological processes, etc. Hence, as stratified beings, rather than beings existing only in one stratum, we have mechanical powers and susceptibilities, as well as those specific to mammals or humans, and our freedom may be limited at any of these levels.

Vertical downwards reductionism tends to be associated with assumptions of a micro-regress to successively simpler and more uniform or atomistic elements. However, even in the physical world, variability seems to 'go all the way down', so that no phenomena are exactly uniform (Dupré, 2002). The metaphysical assumption of atomism, implicit in many forms of reductionism, appears to be untenable. Emergence need not necessarily have exclusively microscopic or more simple preconditions, but can arise from locations within wider structures, as in the case of semiosis, where the meaning of particular phrases is emergent from their relations to wider tracts of discourses and to context. However, holist reductionism, which takes this latter possibility as universal, so that everything is relational, a product of its relations to everything else, and hence in which nothing can ever be indifferent to anything else, or has the slightest degree of context independence, produces bizarre implications of a world in which no particular kinds of entities could be identified, and language would be impossible, since there would be no relatively stable and commonly understood terms which could be applied among interlocutors, who of course would always be differently located in and constituted through the web of relations.[14] It would seem more plausible to argue that there are both internally-related and externally-related objects, that some objects are sharply distinguished from others (e.g. pebbles, knives) while others are not but are instead part of continua of variation and differentiation, and that objects range from the relatively durable and

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[12] Even though physical processes can be altered by human intervention guided by cultural understandings, they can only be altered by physical interaction, and according to their culturally-indifferent properties, and they do not become internally culturalised objects like persons, capable of cultural variation. Thus the chemical industry may produce sulphur dioxide, but Russian sulphur dioxide is the same as British sulphur dioxide.

[13] As Margaret Archer notes, Durkheim could not adhere consistently to this position in his own substantive work. For example, at occasional points in Suicide, he has to acknowledge psychological preconditions and causes of suicide.

[14] This tends to go with a flat ontology, interactionist view (see below).

relatively context-independent through to the ephemeral and entirely context-dependent. (Most social objects appear to lie in the middle of this last range). One-sided, restrictive ontologies, whether of atomism or universal internal relations, are unhelpful and unnecessary.

The complex mixes of internally and externally related phenomena that social scientists study present formidable problems of abstraction – of isolating one-sided aspects of objects so that their structure and contributions may more easily be assessed – without doing violence to the situation by dividing the indivisible or conflating the separable (Sayer, 1992). Simplification and abstraction are unavoidable; the only questions about them are how they should be done and how abstractions should be recombined in the explanation of the concrete.

Interaction or downward interventions: a case for flat ontology?

Higher-order objects can react back on and change lower-order processes out of which they were formed. – for example, people can alter biological
processes through medicine and agriculture. This implies that the higher order mechanisms are not merely epiphenomena but have causal autonomy. However, in noting that people intervene in and modify physical, chemical and biological processes, including those composing human bodies themselves, we may be tempted to conclude that this refutes the assumption of a hierarchical set of relations in which the physical provides the conditions which enable and constrain the chemical, which in turn enable and constrain the biological. It might seem that the relations are symmetric and horizontal, and hence simply *interactions* among things which are all at the same level, implying a 'flat ontology' or position 2, noted above. I think this is a mistake, and that this kind of interaction or reaction back on lower-order mechanisms is not intelligible in terms of a flat ontology. Firstly, there is the problem of asymmetry: even though we can intervene in lower strata and alter them, it remains the case that the physical could exist without the biological, but not vice versa, the biological without the cognitive, but not vice versa. We may be able to change our heart rate deliberately merely by thinking about certain things, yet the heart can function even in the absence of our thinking about anything, but not vice versa. The asymmetry and emergence still holds.

Secondly, it is vital to remember that we are simultaneously biological, chemical and physical beings, and that we intervene in the world through mechanisms that we possess at those levels, as well as through those mechanisms which seem to be distinctive to humans (and perhaps a few other species) and at a higher stratum. The latter may help distinguish us from other objects, but they only partly constitute what we are, for those powers presuppose lower-order mechanisms too, such as cardio-vascular processes, etc. When we intervene in lower-order processes, as we do through agriculture, engineering or medicine, for example, we do so at their own respective levels: we intervene in agriculture at the physical, chemical and biological levels, through digging, watering, fertilising, and weeding, and so on. We do not intervene merely by thinking about agriculture, for discourses have to produce responses in terms of material actions to produce material change. Rather, according to our understandings of the world, we attempt to guide actions towards certain ends by physically, chemically or biologically activating certain ecological mechanisms.

Thirdly, we can change objects and processes only in accordance with their own particular powers and susceptibilities, whatever they are, whether we understand them well or very little. This is another corollary of our argument about the double-sided nature of shaping. This is why interventions in nature often fail, why science and practice in general are so difficult, and why they so often produce results other than those intended. They are not simply products of our wishful thinking. That intractability is not merely an obstacle to intervention but what enables it, for it is these independent powers and susceptibilities (that is, independent of how we regard them) that we mobilise. A simple way of putting this is that we intervene in nature in

accordance with its own laws. This might seem unsatisfactory for sometimes it appears that we change those laws, in other words that we change nature at a very basic level, for example, creating new substances and organisms, breaking relations that were formerly assumed to be necessary. However, when we do this, we again produce a manipulation and transformation which is itself enabled and constrained by the properties of the elements being worked upon. Thus reproductive technologies can change relationships which were once thought to be inescapable, necessary conditions of conception, but they do so by shifting to a lower-stratum and by taking advantage of the powers and susceptibilities of the objects at that level to alter what materialises at a higher level. Again it is material interventions that achieve these material changes. Cultural constructions or discourses on their own are insufficient, even where they are necessary conditions for interventions.

The phenomenon of interaction or downward intervention in lower strata creates the possibility of *co-evolution* in which the development of certain lower order structures and powers is enabled and constrained by the contingent presence or intervention of higher order mechanisms. Thus, our mental development is partly dependent upon the existence of particular kinds of contingent social interactions and conditions which enable the emergence of certain capacities, and in turn these may be susceptible to further development and new emergent powers, again provided certain contingent social conditions obtain. Our development arises from a co-evolution of the social and psychological and biological (Ingold, 2000). It is precisely this interaction and co-evolution that makes it difficult to decide whether psychological and social phenomena are on the same or different levels.

This idea of a flat ontology in which nature is seen as a product of, or indistinguishable from, culture, has become popular in anthropology.[15] There are several ways in which this position tends to be supported. Firstly, advocates may appeal to the fact that our natural environment has been thoroughly transformed by earlier human action, and thus is already cultural, rather than belonging to some extra-cultural realm. However, as we saw earlier, although this is undoubtedly the case, these transformations and the environments and artefacts they produce are enabled and constrained by the properties of the physical and biological processes involved, and do not break their laws. While they are cultural in the sense that, insofar as the transformations are registered by people, they are culturally construed, informed and guided, they are nevertheless not reducible to their cultural significance but are dependent on physical powers which could and have existed independently of cultural interpretations. There is no warrant for a (disciplinary imperialist) slippage from the idea that anything can be culturally-interpreted to the idea that everything is therefore *only* cultural. Again, this is why attempts to transform nature often fail to produce the intended consequences, and why labour and science are hard work. Thus we could argue that one of the reasons western industry has caused so much environmental damage, is the problematic western, instrumental, cultural construction of nature as a resource. These unwanted effects are a consequence of our inadequate understanding of the otherness (independently existing causal powers) of the processes we mobilise and intervene in.

Secondly, it is sometimes supported by the argument that 'we' (humans) are not outside nature, but part of it. However, this is of course accepted. We act within nature as one of its own forces, as one of its internal differentiations. We can and should be aware that we use the term 'nature' in two senses – both as inclusive of humans and counter posed to humans (Soper, 1995).

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[15] Although it may be described as a 'deconstruction' of the nature-culture distinction, it arouses the suspicion of a form of anthropological imperialism, in which the natural is reduced to the cultural.

Thirdly, it is sometimes reinforced by an epistemic fallacy in which it is wrongly inferred from the fact that the knowledge of the sciences is culturally or socially produced, that its objects are too, and in the same sense. This involves conflating objects with actors' concepts of them (as in the ambiguous expression of scientists 'constituting objects'). In addition, it is sometimes bolstered by a slippage from the idea that observations are theory-laden to the idea that they are theory-determined.[16] We do indeed necessarily make observations via available schemata, conceptual frameworks or theories, but that does not preclude at least some expectations being confounded. In order to observe weapons of mass destruction in Iraq, the weapons inspectors clearly had to have concepts of WMD and what distinguished them from other weapons, but those discursive constructions did not determine what they found – they still had to go and look and try to answer their empirical questions. What they observed was theory-laden but not theory-determined.

Fourthly, it may be defended by arguments to the effect that rejections of this position must claim some kind of Archimedean standpoint, outside existing cultural interpretations, one which actually involves an unacknowledged, ethnocentric assertion of a western, modernist cultural standpoint. After all, many cultures do not use a culture-nature distinction. However, critical realists agree that we can only understand the world via available discourses and cannot get outside them. But discourses are not immune to empirical challenge, as our WMD example shows, and nor are they perfectly coherent and consistent. Critique can always work from within discourses exploiting their inevitable inconsistencies. As regards the relative adequacy of different cultural accounts, this is a matter for substantive argument concerning particular understandings. We have already noted one of the ways in which western understandings of nature are deficient, and while the understandings of other cultures are helpful in identifying these problems, some of the problems may be registered through western theory-laden empirical feedback, such as that which identifies global warming. Knowledge is primarily a practical matter of coping with the world, and while not just any kind of understanding can cope equally well as any other, many different understandings of our relation to our environment may be 'practically-adequate' in the sense of allowing their holders to live successfully. Cultures are not hermetically sealed from or closed to one another, such that dialogue and critique are impossible, though intercultural exchanges are likely to be difficult, and it is illiberal to ban inter-cultural critique. (As a westerner I welcome other cultures' critiques of western culture.) The alarming environmental and social consequences of western cultural constructs of nature shows that cultural understandings are fallible and susceptible to critique, both from within and from other cultures. The adequacy of the culture–nature distinction or relation itself is a matter of argument, not cultural faith.

Moving on from the culture-nature relation, there are other arguments against emergence. Tim Ingold discusses the phenomena of consciousness and the self, criticising the idea of these being emergent from preconditions existing purely within the individual, and argues instead that consciousness and the self are not bounded by the body but are relational (Ingold, 2000; 2005). Thus, it can be argued that the self depends on social relations, that consciousness depends on interactions with others and with the environment, so that in some sense it is 'seamlessly distributed across persons, activities and settings' (Ingold, 2005). Ingold takes this to imply that the world is not layered, but relational, so that what any one process is and can do, depends on its relations to other processes. I agree that these particular claims about the self and consciousness are plausible,[17] but that they presuppose, rather than contradict, ideas of stratification and emergence. I noted earlier that emergence is not restricted to cases where the preconditions of the emergent powers are internal to the

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[16] Or more accurately – 'concept-laden' and 'concept-determined'.

[17] They need much qualification, however, regarding just how extensively selfhood is diffused, how the claims are to be reconciled with reflexivity and responsibility (see Archer, 2000; 2003). Without such qualification the mind-body may be emptied of all content and filled with 'social foam', as she puts it (2000, p.317).

objects having those powers (i.e. micro-preconditions) but may arise from the objects' insertion into wider relations, as in the case of semiosis and discourse. I would suggest that the self and consciousness are also examples of this kind of emergence rather than mere interaction. Moreover, they are products of emergence rather than mere interaction because they involve the same kind of asymmetric relations with biological and other physical conditions discussed earlier.

Some common kinds of reductionism in social science

There are many further forms of reductionism in social science. The work of Margaret Archer represents a far-reaching critical realist critique of many of them, particularly those relating to structure and agency and individual and society, and I commend her recent books on these subjects to readers (Archer, 1995; 1996; 2000; 2003). Rather than go over similar ground I shall focus on four types of reductionism, only the first of which is a central target of Archer's critique.

Strong social constructionism and anti-essentialism

Strong or idealist constructionism is a form of upwards reduction of being to knowledge or discourse, and construction to construal, so that phenomena, including socially constructed phenomena, are reduced to concepts of or discourses about them.[18] Conversely discourses are seen as perfectly performative – *perfectly* because they not merely contingently produce what they name but they do so infallibly, regardless of the intractabilities of the materials – physical, psychic, social, ideational – which they use in their processes of construction. Indeed, since the materials are supposedly also merely socially constructed, they have no properties independent from those which the construal gives them. This implies that collective wishful thinking always works. It confuses knowledge with what it is about, and assumes that construals automatically and successfully become objectified as constructions. The reductionist character of strong social constructionism is evident in the popularity of the hyperbolic metaphors of *construction* and *constitution,* as in the claim that the subject is 'constituted in discourse', which represent complex processes of co-evolution and fallible shaping as the unilateral production of subjects by discourse out of nothing. On this view physical phenomena are no more than what they are socially constructed as (or rather construed as) by physicists or others, and the social constructions and discourse of scientists and others 'go all the way down'. Quite why science, is so difficult and laborious, so prone to failure, is inexplicable on this view. Ironically, it presents a view of knowledge as incorrigible, since there is nothing outside or independent of knowledge about which it can be mistaken. To borrow and extend Bourdieu's term, it is the ultimate 'scholastic fallacy', a product of the projection by those whose work focuses heavily on discourse and the endless play of difference within it, of that orientation to the world onto the world at large. If we are to understand the fallibility of knowledge, we have to be realists, that is, we have to acknowledge that it is about something independent of any particular observer's construal, such that they can be mistaken about it. This is entirely compatible with the view that we can only experience and know the world in terms of particular schemata, or discourses. Contrary to a common misconception, it is the fallibility[19] of knowledge which gives us warrant for

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[18] A moderate constructionism accepts the reality of social constructions, but distinguishes them from the construals that inform and interpret them, and acknowledges the fallibility of attempts at social construction.

[19] "The real world is not a dream-world under my control, a fiction my language has created and can mould to my convenience. Reality is more resistant. At many levels, things are not always as I want them to be, or conceive them to be. Realism has to start with the realization

believing that the world – and I include the social world - is not merely our voluntaristic construction.

A further reinforcing element is again imperialist concepts of culture, in which not only is everything we know understood in culturally-inflected ways, but everything is presumed therefore to be cultural, as if nothing had any qualities that were independent of their cultural significance. With the help of a little disciplinary imperialism it is tempting for sociologists and anthropologists to conclude that since the sciences and other academic knowledge are themselves different ways of making sense of the world, sociology and anthropology are master disciplines affording their disciples privileged insight into all these other kinds of knowledge, able to see what those they observe cannot, namely that their knowledges are (just) particular cultural constructions.

'Blank-slateism' – the treatment of people as blank slates on which anything can be written by cultural or social processes, or as 'indeterminate material' (Durkheim) - is an example of the kind of reductionism which reduces shaping to a one-sided unilateral process, as if enculturation or socialisation had no psychological or biological conditions. It is buttressed by a fear of a converse reduction of the social to the biological. It obviously completely fails to explain why most non-human objects are not similarly susceptible to such profound cultural influence and variation, as opposed to being externally construed and used in different ways according to culture.[20] Although it can be modified to avoid this problem, Bourdieu's concept of habitus – the structured set of dispositions acquired by individuals as a result of being subject to a specific configuration of social relations and influences, particularly in early life, dependent on their particular location within the social field - is an example of this reductionism (Sayer, 2005). Not just anything can acquire a habitus, and we must have certain properties to enable us to do so. At best it serves as a provisional place filler for an account of psycho-social processes. Similar problems attend the Foucauldian reductionist concept of subjectification. There must be something about people that makes them susceptible to such influences, though accounting for this would take us beyond sociology into fields such as psychology and hence be problematic for sociological imperialists. One of the most common kinds of reductionism in social science involves forgetting this second side, thereby producing representations of the production of change as a one-sided unilateral process. However, as we noted regarding co-evolution, in part the development of susceptibilities to enculturation at any particular time, is itself the contingent product of earlier phases of interaction.

One of the reasons why strong versions of social constructionism are popular in sociology and anthropology derives from the fact that they are much concerned with cultural variation, with the remarkable variety of different ways people can make sense of and organise their world and themselves, and as a result become very different kinds of people, though each may imagine that theirs is the definitive understanding of the world. Yet for us to be

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that I or anyone else can be wrong. Fallibility is part of the human condition. Any view which denigrates reasons, and the possibility of truth, and which even doubts our identity, is in fact saying that there is no way in which we can be mistaken, either individually or collectively. Each epoch will have its own views, its fictions and even that view will be a fiction. Even the notion of fiction collapses, since there will be nothing left to contrast it with. If we cannot be right, we cannot be wrong, and if we cannot be wrong, we cannot be right. When everything is linguistically constructed, language itself will collapse. So far from the differentiation between subject and object being the consequence of a concentration on language, language itself depends on it." R.Trigg (1988) Rationality and Religion, Blackwell, Oxford, p. 159.

[20] To explain how other species, e.g. dolphins, chimpanzees, seem to exhibit cultural variation, we would again have to identify what it is about them that makes them capable of or susceptible to this.

enculturated in various ways, we must be the kind of beings who are susceptible to and capable of such influence – different from objects such as rocks, which are whatever they are regardless of how different cultures or discourses construe them. The high-order phenomenon of cultural variation is rooted in and emergent from particular kinds of lower-order phenomena (neurophysiological preconditions, social interaction), but the latter do not dictate or pre-determine and help enable us to predict whether we are enculturated to be atheists, Christians or Muslims or whatever.

Strong social constructionism is itself fuelled by a fear of a converse form of reductionism – usually described as 'essentialism' – in which objects are attributed fixed, natural powers which pre-determine what they do. The principle target of anti-essentialism has been naturalised accounts of gender that take it to derive from uniform and immutable biological qualities unilaterally determining our behaviour. The effect of this is to naturalise what is a product of a contingent co-evolution of the social, psychological and biological and the effects of particular, local social conventions. The naturalisation of such conventions and suppression of difference and alternatives is obviously oppressive. I agree that gender does not have a fixed essence, though it does not follow from this that nothing has. Anti-essentialists may fear that critical realists' attribution of any causal powers and susceptibilities to actors amounts to essentialism. However, such powers are not necessarily fixed but themselves depend on the contingent reproduction of their preconditions, some of which may be social. Causal powers may mutate or fail to be reproduced. Nor need they be identical in all cases of a particular class of object; the physical powers of people obviously vary significantly. Secondly, to identify particular powers or essences as defining certain objects is not to reduce those objects to those powers, for they may have accidental properties too, which differentiate them, and which may be crucial in certain contexts. Thus, to ascribe certain powers to humans need not entail denying their scope for variation. Thirdly, the activation of causal powers is not inevitable but dependent on context. Fourthly, again as noted earlier, if and when they are activated, the effects also depend on the context. Thus, attributing causal powers or susceptibilities to people does not entail the determinism and suppression of difference that anti-essentialists fear (Sayer, 2000b). It allows and indeed helps us to understand the complex kinds of co-evolution involved in socialisation noted earlier. The universalism implied in imputing human powers does not entail uniformity and an underestimation of human variety, indeed the remarkable capability of humans for cultural variation presupposes that they have the particular powers which enable this (Collier, 2003). The fact that some other species also seem capable of cultural variation does not contradict this but merely invites us to ask what it is about them that enables them to have this property too.

Social ontology and the apathetic actor

Positivist, behaviourist and other strictly naturalist philosophies of social science, which reduce action to behaviour, and actors to agents with only physical powers, represent one scientistic form of reductionism. Anti-naturalists who respond by ignoring causal powers and who reduce the social to the hermeneutic, and hence reduce the task of social science wholly to the interpretation of meaning, invert this reductionism. This also tends to abstract meaning from practice, from habituation and embodiment, thus producing an overly rationalized and discursive model of action, as noted by Bourdieu (Bourdieu, 2000). In practice, as theorised by critical realism[21], we need both causal explanation and interpretative understanding to explain social phenomena, for as we noted earlier, semiosis can itself be causally efficacious, indeed that is its point. We also need to recognize the practical, habitual character of much

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[21] And by Max Weber, albeit unsatisfactorily.

action, in which, as Bourdieu and Merleau-Ponty have emphasized, embodied know-how figures more prominently than discursive, propositional knowledge.

While this avoids the opposing reductionisms of the first two approaches, it might still be termed reductionist insofar as it fails to take explicit account of the fact that we are not merely causal agents and meaning makers, but needy beings, characterised by lack, drives, want and desire, and capable of flourishing and suffering. These are special powers and susceptibilities in that they are not merely potentials but ones that require and seek solutions or satisfactions. They are purposive, and their satisfaction may be crucial for well-being or indeed survival in some cases. The neediness is not merely physical but psychological; for example, we have a need for recognition and sociability. We also have the tendency to form attachments and commitments to others, and to practices, causes and things, whose maintenance can become important for our well-being, so that our attachment is not merely intellectual, but emotional, such that detachment or loss is experienced as a kind of bereavement or injury. Our relationship to the world is not merely one of causal agent or contemplative interpreter but one of *care* (in Heideggerian terms), or concern, arising from our vulnerability, dependence and neediness. It is from this relationship to the world and others that normativity and morality arise.

To put the point another way: while the analogy of shaping shows the necessity of theorising the matter of just what it is that is susceptible to socialisation or subjectification, it presents a rather passive view of the person, as still conditioned by 'hydraulic' social pressures, even though the results depend on her susceptibility to them. This is a form of reductionism (of agency to structure) in that it ignores firstly the mediation of those influences by our perceptions and reflexivity (Archer, 2003), and secondly our pro-active orientation to the world, of care and concern, stemming from our vulnerability, neediness, drives and lack. It produces a model of actors as apathetic, as mere cultural dopes. Thus, it is partly our need for food and shelter, and for the support, company and recognition of others, etc., which makes us susceptible to the prevailing norms and goals of our culture through which those things are contingently provided.[22] While there is some recognition, albeit uneven, in some contemporary social science, of the mediating influence of perception and reflexivity, explicit acknowledgements of our orientation to the world of care are rare. Rather individuals are represented as having more or less autonomy, more or less susceptibility to social influence, as being capable of reflection, and sometimes as embodied and practically engaged with the world, but rarely as needy beings, concerned about their world.

Possible reasons for this common form of reductionism are: 1) the scholastic fallacy identified by Bourdieu, in which academics project their cognitive, contemplative relationship to the world onto those they study, ignoring the overwhelmingly practical nature of everyday action (Bourdieu, 2000); 2) a related scholastic fallacy (ignored by Bourdieu) in which social scientists project their acquired, positive, 'de-normativized' academic orientation to the world onto actors, thereby failing to take lay normativity, which stems from this neediness, seriously, either by ignoring it or reducing it to 'beliefs' or 'values', which in turn are treated simply as facts about their holders; 3) difficulties in empirically identifying needs and concern in a rigorous fashion; 4) a fear of 'essentialising' needs and desire, underestimating the social element in their co-evolution; and 5), a fear that acknowledging this will admit a teleological form of explanation into social science.[23]

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[22] Kathryn Dean uses Freud's concept of 'cathexis' as involving 'culture's "occupation" of the biological by way of the emergent subject's more or less active response to an "invitation" to attend to a part of the world in a particular manner."(Dean, 2003, p.19). At the same time agency itself can be promoted or limited by culture.

[23] By their very nature, needs, lack and desire need not be satisfied. The fear of teleology is all the more likely where 'the subject' is treated as singular rather than multiple so that it

Reductionism and the fact-value family of dualisms: the derationalisation of values and the devaluation of reason

Although it seems to me to be simply dogmatic to reject all dualisms *a priori*, many particular dualisms turn out to be problematic in practice and can be criticized on *a posteriori* grounds. The problems often involve a form of reductionism – in which a complicated pattern of difference is reduced to two single, simple, purified opposites, with no internal complexity and no intermediate terms. In addition the two sides tend to be defined mutually and negatively in terms of what the other is not. The particular problematic dualisms that I want to comment on here belong to what might be termed the 'fact-value family of dualisms' (see Putnam, 2002). These dualisms are not merely philosophical constructs but are institutionalised in the very organisation of contemporary scholarship and education, with the attempted expulsion over the last two centuries of values from social science, and the corresponding ghettoisation of normative thought in moral and political philosophy. They shape the way social scientists think about both their academic work and the nature of values and reason in the lives of those they study:

Fact-value

is – ought

reason - emotion

science – ideology

positive - normative

objectivity – subjectivity

It might seem that this family of dualisms has already been widely deconstructed. However, it has so only in a one-sided manner, leaving a highly damaging form of reductionism intact. In effect, what has happened in the post-positivist literature, is that qualities identified by the terms on the right hand side have been argued to be found also on the left hand side, so that subjectivity, values, etc., are to be found in science and the factual. Thus, there are probably now more social scientists who believe that social science cannot be value-free than believe it can, and indeed many who believe it should not try to be. Much of the literature in the philosophy of social science and especially feminist theory over the last few decades has addressed this 'seepage' of qualities across the dualisms from right to left. However, what has not been noted, is the lack of seepage in the opposite direction, in the form of arguments that some of the qualities of the terms on the left – objectivity, reason, etc. – are to be found on the right too. The deconstructions have therefore been one-sided in that they have not

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appears that social development might have a pre-determined goal or destination, and also where essentialism is misunderstood as a doctrine which argues that the essences or powers of objects unilaterally and deterministically produce certain effects (Sayer, 2000b).

challenged the fundamentally reductionist and *de-rationalized* conceptualisation of values, subjectivity, emotion and normativity that has been distinctive not only of positivism but modernist thought.[24] Thus, many who regard themselves as radical critics of the dualisms continue inadvertently to reinforce them by assuming that the right hand side are beyond the scope of reason, that emotions are reducible to affect or feeling and lack cognitive content, that values are not related to the nature of the world, that valuation is radically different from reason, and that normativity has nothing to do with the way the world is. On the one hand, those who still aim for value-freedom regard values as a kind of irrational or arational contaminant threatening the objectivity of social science, while many of their critics, also confusing objectivity with neutrality, respond by keeping values and throwing out objectivity, and hence inadvertently confirm this de-rationalised conception of values.

In sociology the de-rationalisation takes the form of either subjectivism (values are merely subjective beliefs, not about something and capable of being true) or conventionalism (values are no more than conventions – 'what we do round here') as if they were unrelated to flourishing or suffering, or as if the latter themselves were merely subjectively or conventionally determined. (These are assumptions that no-one can *live*: for example, when someone seriously harms us, we do not say 'in my subjective view that is wrong' or 'we just don't do that round here' or 'don't you realise that that's culturally constituted as bad'. Instead, we point to the suffering that has been caused.) These problematic conceptions of values continue to limit social science, causing it to provide a largely alienated understanding of the social world, such that it is hard to understand why anything matters to us.

This common form of subjectivist reductionism involves a confusion of three different and independent meanings of 'objective' and 'subjective' (respectively as): 1) value-free and value-laden; 2) true and untrue claims or claims that seek or do not seek truth; and 3) pertaining to objects and pertaining to subjects. As a result, objectivity (2) is confused with and assumed to require value-neutrality (1) and conversely values are seen as threatening objectivity (2) when they need not. Also subjective views (3) are assumed to be untrue or unlikely to be true (2), when again they need not (Collier, 2003; Sayer, 2000b). Truth is also often understood as an all-or-nothing matter, which renders the concept unusable and generates concerns about dogmatism.

One of the fronts on which this de-rationalization of values has begun to be challenged concerns emotions. Theorists such as Archer (2000), Helm (2001), Nussbaum (2001) and Oakley (1992) argue that emotions are not reducible to their affective dimension but also have cognitive and desiring or motivating elements. Emotions are evaluative judgements of matters affecting, or imagined to affect our well-being, and hence one can speak of 'emotional reason' instead of counterposing emotion to reason. Of course, emotional judgments are fallible – we may be mistakenly worried, for example, but unemotional reason can be fallible too. Infallibility is not a requirement of rationality[25], and fallibility presupposes that there is something – the object of our thought/feeling - about which we can be mistaken (Collier, 2003). Emotions are obviously subjective (in sense 3 – pertaining to subjects) but they can also be about objects (things about which we feel fearful, proud, ashamed, etc.) and their judgements may or may not be mistaken.

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[24] It is particularly associated with the rise of markets, which are a 'reason-neutral' sphere of social action in which buyers do not have to justify their their 'preferences' in order to buy: all that is needed is the money.

[25] Unless we reduce rationality to logic, though as we shall see that reduction is part of the problem.

If we acknowledge that the subjective and the value-laden are not beyond the scope of reason, and indeed that valuation and reason overlap, then we can begin to counter this form of reductionism. To understand the social world we often need to use 'thick ethical concepts', such as 'cruel', 'generous', 'arrogant' or 'oppressive', whose meaning cannot be rid of normative evaluations without loss of positive descriptive power.[26] Such concepts allude to whether people flourish or suffer, and flourishing and suffering are in turn simultaneously positive and normative, not one or the other. At present, however, the incomplete deconstruction of the dualisms means that the de-rationalisation of values remains largely unchallenged. One possible inhibition to the deconstruction is the liberal belief that conceptions of the good should be regarded as private matters for individuals, and fear that challenging this and acknowledging the rational character of values, will license dogmatic, authoritarian ideas of 'moral truth'. However, like positive claims, evaluative judgements are fallible and contestable and can be treated as matters public deliberation. It is dogmatism, not discussion of values, that we have to fear (Anderson, 2004).

The de-rationalisation of values is complemented in modernism by the reduction of reason to rationality and often to logic, removing its propositional dimension and its involvement in valuation. Thus, in mainstream economics, rational economic actors' preferences don't have to be rational, (how could they be, for preferences are seen as de-rationalized values?), they just have to be consistently or logically followed and acted upon. In order to counter the derationalisation of values we need to counter the reduction of reason to logic and reinstate an older concept of reason, still present in concepts of what it is to be a reasonable person, as attentiveness to the nature and particularity of the object or situation being dealt with (Collier, 2003).[27] Such an understanding includes instead of excluding *phronesis* or practical wisdom oriented to questions of how to live.

The de-rationalisation of values involved in this form of reductionism complements the previous kind of reductionism discussed, regarding our neediness and concern-ful orientation to the world, for values are directly or indirectly related to our nature as needy beings capable of flourishing or suffering. To acknowledge someone's need for something is simultaneously to make a positive ('world-guided') judgement about them and a normative ('world-guiding') judgement implying, ceteris paribus,[28] that something should be changed. Thus the things which do not fall neatly into either side of the fact-value dualisms are not mere curiosities but precisely the things that matter most to us. The de-rationalisation of values and the devaluation of reason therefore imply a profoundly alienated social science.

Reductionism and responsibility, explanation and justification

As we noted at the outset, one of the most powerful forms of reductionism, particularly in commonsense thought is individualism and its tendency to treat individuals as solely responsible for their character and fate, radically underestimating the extent to which who we

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[26] Theorists of early modernity, such as Adam Smith, predated this tendency to imagine that the normative must be divorced from the positive and that any evaluative content to descriptions could only weaken their objectivity.

[27] 'Reason is the capacity to behave consciously in terms of the nature of what is not ourselves. We can express this briefly by saying that reason is the capacity to behave in terms of the nature of the object, that is to say, to behave objectively. Reason is thus our capacity for objectivity' (Macmurray, quoted in Collier, 2003, p. 158). While I think this is valuable, it has to be added that sometimes, and particularly where values are concerned, the object is ourselves.

[28] There may sometimes be overriding considerations which allow us to acknowledge the need but say that nevertheless it should not be met (Taylor, 1967).

are and what we become depends on social circumstances beyond individual control. Thus, crime is purely a matter of individual responsibility, and there are no social causes or influences. Similarly, individuals are responsible or largely responsible for their class position. One of the most valuable functions of social science is in countering this reductionism. In so doing, however, it is tempting to flip over into a converse form of reductionism – social determinism, in which individuals have no influence or responsibility. This is an untenable position that generates theory-practice contradictions, for like everyone else, in their daily practice, social determinists hold others personally responsible for their conduct – for example, when they mark students' essays, or cooperate with and rely on colleagues.

Individualism tends to be favoured by the right, and social or structural determinism by the left, though of course there are many intermediate mixes. One problem for social determinism in social research is precisely the irreducibility of individual reflexivity to its preconditions, so that it can only be roughly predicted on the basis of the latter. Thus some actors may behave in ways not expected in the light of their social and discursive positioning. The difference that individual responsibility makes then appears as a source of 'noise' in the data, obscuring the assessment of social influences. Despite its moral significance, it thus tends to be treated as a nuisance rather than an object of interest in itself.[29]

On certain occasions, despite their emphasis on social determinants of behaviour, radicals have to acknowledge the limitations of social determinism and draw back from it. An example that has lately been much discussed concerns social explanations of terrorism. The Right tends to respond to these by complaining that such explanations do not justify terrorism, as if this meant that they could not stand as explanations. The Left responds by saying that they are not justifying terrorism, merely explaining it (Butler, 2004; Williams, 2003; 2004). Although I think the distinction is legitimate, it depends on a view of responsibility which rejects thoroughgoing social determinism and allows some room for individual (and group) responsibility. This may be uncomfortable for those who have thoroughly decentred and effectively disempowered the subject, but it is an instructive counter to precisely those kinds of reductionism. Yet while the individualist and social determinist positions are easy to criticise, the problem of how we should allow for both individual responsibility and social determination, if not determinism, is immensely difficult. While it is much discussed in philosophy, it is again simultaneously both a positive and a normative matter, requiring an understanding of how individuals and their social context, including their moral sensibilities and character, co-evolve from birth, so that it is possible to assess what is reasonable to expect of them in the circumstances.[30] It represents one of the most pressing challenges not only for philosophy or indeed for social science but for how we understand ourselves and others in everyday life.

Conclusions

To claim that some description or explanation is reductionist in a pejorative sense is to say that it misidentifies its object either by explaining it at the wrong level, ignoring its emergent powers, for example, the sense of pride or shame by reference to physiological changes associated with them, or by omission of important co-determinants of a multi-causal situation and by attributing the effects of those omitted elements to the remaining elements that are acknowledged. Critical realism offers an anti-reductionist philosophy based on an ontology of

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[29] Conformity to social influences may also depend on reflexivity and the exercise of a sense of moral responsibility.

[30] For a discussion in relation to matters of social justice, see Barry (2005).

stratification and emergence. By contrast, philosophies which assume atomism and regularity theories of causation fail to explain emergence, and hence evolution and novelty. Approaches assuming a flat ontology, in which the physical, the biological, the social are all on the same level, in a relational field, fail to address the asymmetric relations among these processes, noticing only their interaction. Critical realism further allows us to incorporate and combine the insights of both naturalist treatments of causation and hermeneutic or interpretive approaches to social research. Nevertheless it remains a project of substantive research to identify specific kinds of strata and emergent properties, and particular forms of interaction among mechanisms at different strata, and of co-evolution.

I have selected just a few forms of reductionism in social science for discussion, and I have paid more attention to forms of 'upwards reductionism', such as strong social constructionism, than the more familiar downwards reductionism of approaches such as socio-biology, not because they are any more dangerous, but because they represent unsatisfactory responses to the problems of the latter. In social science, fear of a deterministic form of essentialism which naturalises what is actually a

(co-)product of particular social and cultural forms has driven many scholars towards strong social constructionism and anti-essentialism. In the process the baby of emergent causal powers and susceptibilities has been thrown out with the bathwater of determinism or essentialism. I have also discussed further, less widely-recognized, forms of reductionism in social science, firstly to do with the neglect of people's evaluative or care-ful or concern-ful orientation to the world, by virtue of their neediness and susceptibility to both flourishing and suffering, secondly to do with the de-rationalisation of values, and finally to do with the vexed question of responsibility.

It should, I hope, be clear that while, in the abstract, reductionism seems a purely philosophical matter, it has great political significance, for it has major implications for what kind of beings we understand ourselves to be, and for what we can hold ourselves responsible, and how we should respond to others. Finally, I hope that it will also be clear that if we are to correct such problematic forms of reductionism, it is vital to put aside the disciplinary imperialism that nurtures reductionisms and adopt a postdisciplinary approach.

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