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First and second order unification in the social and human sciences

'The unity of a plot does not consist, as some suppose, in its having one man for its subject. An infinity of things befall that one man, some of which it is impossible to reduce to unity; and in like manner there are many actions of one man which cannot be made to form one action. One sees, therefore, the mistake of all the poets who have written a *Heracleid*, a *Theseid*, or similar poems; they suppose that, because Heracles was one man, the story also of Heracles must be one story.'
Aristotle, *Poetics*, 1451a16-21.

1. Theories and disciplines

Any project of unification of the sciences, natural or social or otherwise, requires a prior agreement about the construction to be put on the term 'science'. We might begin by agreeing that science, whatever else it may be, is a theoretical enterprise. Along with the theory usually goes a practice, computational, experimental and the like, so that we have the familiar contrasts between theoretical and experimental physics, for example, or between ethnography and ethnology in anthropology. But it is also possible to look at physics, anthropology and the like not only as theories with their accompanying practices, but also as disciplines, to be studied and professed. 'In a science the ultimate object is knowledge, about the world or about society, and what practice there is follows from the knowledge (or serves it, e.g., in experimentation), whereas in a discipline the object is an activity, carried out, of course, in a suitably disciplined way' (Caws 1993, 351). The assignment of intellectual (and especially of academic) work to various disciplinary categories tends to serve administrative and organizational purposes, as in teaching, publication and the like. The question of how the disciplines are established and

how they correspond to distinct bodies of knowledge is itself a challenging one (see Caws 1999).

The problem of unification in science may therefore take two distinct forms: that of theoretical unification and that of disciplinary unification, one of which may be more tractable than the other. In what follows I shall argue that theoretical unification in the sciences is more readily achieved than disciplinary unification, and that the problem of unification in the social sciences can be clarified by the invocation of the concept of the 'human sciences' and its relation to, and contrast with, that of the natural sciences.

A theory can be - in some sense must be - something that an individual knower has. Given the origins of the term in the name of the Athenian *theoros* (the official observer at the games or the consultation of oracles) it represents a 'way of looking' at the world, or part of it, that has a certain formality and status. An isolated theoretician (Newton, Einstein, Darwin, Freud) can come to have a more inclusive way of looking, taking in under a single aspect parts of the world formerly viewed as disparate; this is one of the main historical mechanisms of unification. But a discipline can hardly be sustained by an individual; the disciple needs a teacher, the process of acquiring the discipline involves a collective practice. The two are closely connected, as suggested above, in that one object of the discipline, in the cases that are of interest to us, is the acquisition of the theory. Disciplines ensure the persistence of theories, passing them on from one generation of scholars to the next. And it is usually in a disciplinary matrix that theories meet challenges, which may result in their modification or demise. Disciplines, however, move more slowly than theories - it may be a long time before the theoretician's linking of domains is translated into a merging of disciplinary programs.

Perhaps this need never happen - running a discipline is a very different matter from entertaining a theory. It's not just that there are battles over academic turf, not all of which are worth fighting, but there are also historical and traditional issues to be considered, as well as questions of intellectual *Lebensraum*. The sociologist Randall

Collins has claimed that in the history of a discipline - he is talking about philosophy, but the point is more general - only three to six major positions (and by implication major figures identified with them) can coexist at any one time. He calls this the 'the intellectual law of small numbers' (Collins, 81). If the claim holds it follows that the conflation of two disciplines should demote up to half a dozen major figures to secondary status. The main casualty here would not be their wounded egos but the availability of role models to a new generation, not to mention research funding and all the other appurtenances that go with leadership in a field. In practice we probably need not worry: the outcome of the merging of two theories when a new higher-level theoretical structure subsumes them both is often not one discipline but three - the two original ones and a new one that springs from their intersection. When the physical basis of biology became firmly established both physics and biology survived in their old form, but they were joined by a new speciality, biophysics. To adapt my epigraph from Aristotle: a multitude of things may happen to one theory in disciplinary space, some of which it may be impossible to reduce to unity. We need not make the mistake of supposing that because a theory is one theory, the discipline of that theory must be one discipline.

2. First- and second-order unification

Another way into this question is to think of the unification of disciplines as first-order unification, at academic ground level, and the unification of theories as second-order unification, at a higher level of abstraction and generality. The unity of what there *is* seems unproblematic - we call it the universe, the turning of all things towards one thing. That is as abstract and general as it gets. But the unity of what we *know* - of what we can say about what there is - is not so easily grasped. We come across different bits of the universe at different times, we apprehend them partially, we don't see their interconnections at once or perhaps at all. What we come to know is unified in a rough and ready sense, in that it's always one person's knowledge, but elements of it may conflict with one another. Depending on the knower's tolerance for cognitive dissonance

this may not matter very much, but the possibility of achieving a coherent and connected structure of knowledge, an ever more complete picture of what there is, remains one of the lures of human cognition. Henri Bergson used to go Aristotle's dictum ('All men by nature desire to know') one better: 'we should all begin, as mankind began', he would tell his lycée classes, 'with the simple-minded but noble ambition to know everything'.

In spite of its apparent naivete this proposal of Bergson's seems to me quite feasible, on condition of making a few distinctions - such as Galileo's distinction between intensive and extensive knowledge, or the distinction I draw (following George Sarton and no doubt others as well) between direct and indirect knowledge. Extensive knowledge is the knowledge of cases *seriatim*; intensive knowledge is knowledge of principles that subsume many cases at once. God knows everything extensively, and we couldn't aspire to that, but we can know some things intensively as well as God does: mathematical propositions, for example, or principles (as opposed to the details of the cases that fall under them). Direct knowledge is knowledge that we can reliably communicate on demand, without having to look it up or ask anyone. We know only some propositions in this way, but if we're suitably connected or supplied with appropriate resources we can know all the other propositions (all the ones there are to know, which is one plausible construction of 'everything') by looking them up or asking someone who already knows. I call this indirect knowledge. Just as in the Galilean case we can't know it all at once, or, extensively, ever, but there's none of it we couldn't know if we put our minds to it and had enough time. Carrying this off requires a couple of special kinds of direct knowledge, which I call exemplary and fiduciary. Exemplary knowledge is enough direct knowledge of what we're asking about to be able to make sense of the answer, and fiduciary knowledge is knowledge of the reliability of the sources we consult or the people we ask.

The sources and the people will normally belong to disciplines - that's how we know what to look up or whom to call. The resulting knowledge, if it is of anything complex, will come from several disciplines, and the inquiring knower will find herself in command of relevant aspects of each of them, working together to throw light on the

object of inquiry. Being able to marshal this knowledge and bring it to bear demonstrates a form of theoretical unification, in the person of the knower. T.H. Huxley used to give a lecture, 'On a piece of chalk', in which he canvassed all the bits of science one would have to know in order to understand the origins and properties of a morsel of chalk from the Sussex Downs. I have adapted this idea for students in interdisciplinary courses as what I call the 'chalk game', the challenge being to specify what resources of what disciplines they would have to call upon to explain as completely as possible some arbitrarily chosen object or event: a cigarette lighter, a piece of money, a ball-point pen. From the point of view of the game the differences between disciplines are less important than their common relevance to the explanatory process. This goes as well for the differences between the natural-scientific disciplines and the social-scientific ones - in the cigarette-lighter case the physics and chemistry of ignition and combustion will find themselves cheek by jowl with agricultural economics and the psychology of addiction, to mention only four out many relevant topics that will eventually have to be called in.

3. Why unification?

Such personal and eclectic gathering-in of the disciplines is unification of a kind, but a far cry from what the unity-of-science movement had in mind. The drive to unification has ancient roots as well as modern exemplars, running from Aristotle and the two Bacons, Roger and Francis, through the French encyclopedists to Auguste Comte and John Stuart Mill, on to the Vienna Circle and Herman Hesse's Glass Bead Game, up to recent attempts to develop a TOE or theory of everything. In its most elaborated form it has tended to concentrate on the physical sciences, for reasons that I will try to spell out (I have not forgotten that my topic is the social sciences, and I promise to come back to them.) But it is not always so obvious what the drive is driving at.

Why have people wanted a unified science? Their motivation may at different times have been intellectual curiosity, or aesthetic satisfaction, or pedagogical economy, or

administrative convenience, or even political liberation. The latter in fact seems to have informed the concept of unification most prominent in the literature of the middle of the last century: Neurath and his associates in the Vienna Circle really did think that a unified scientific conception of the world, that would subsume or displace the heterogeneous cultural and metaphysical conceptions that had landed the West in what they rightly saw as an untenable situation in the wake of the First World War, would have the effect of freeing mankind from inhumanity and encouraging the spread of democracy.

The principles of unification on which the Vienna Circle rested its hopes were however strikingly narrow. Carnap's pamphlet of 1934, *The Unity of Science*, ends with the assertion that '... the statements and words / the facts and objects of the various branches of science are fundamentally the same kind. For all branches are part of the unified Science, of Physics' (Carnap, 101). He means to include the social sciences in this claim, which rests however less on a conviction that social facts are merely physical than on an argument about language, namely that the language of physics is the only one that can lay claim to scientific status. *If* there is to be social *science*, *then* it will be part of physics. The argument concludes that there is only one possible intersubjective language, namely what Carnap calls 'the physical language'. 'Science is the system of *intersubjectively valid statements*. If our contention that the physical language is alone in being intersubjective is correct, it follows that *the physical language is the language of Science*' (Carnap 1934, 66-67).

This aspect of the unity of science movement is worth remembering because it was on to something important. We really do need intersubjectively valid statements, and it really is hard to come up with them outside the physicalism of the natural sciences. Also that physicalism goes a very long way towards explaining our world. But it runs up against a fatal limitation (or, from another point of view, a liberating possibility) when it encounters non-physical, non-material, non-perceptual objects. It was a failure to recognize that there could be such objects (as objective, after their own manner of objectivity, as physical objects), or that they could be described in valid intersubjective

terms, that hampered the ambitions of the unity of science movement. I shall be calling them intentional and especially 'cointentional' objects, preferring the latter description to 'intersubjective', though the idea of an intersubjective language - that is, one whose statements are valid for many if not all subjects - can be carried over from the logical empiricist program. Curiously enough Carnap had set out, six years before his essay on the unity of science, to construct science on a basis that would have been friendly to the possibility of such objects if only he had been able to carry it through. In *The Logical Structure of the World* he attempted to establish a 'constructional system' on the basis of the 'immediately given', and specified various levels of construction, principally the physical, the psychological, and the cultural. But he insisted on starting from sensory, mainly visual, experiences available to an individual observer (the 'autopsychological basis') and proceeding by an unbroken stepwise ordering that would eventually yield objects at higher levels. All the objects would belong to the same domain: 'there is only one domain of objects and therefore only one science' (Carnap 1967, 9). In the end the project did not succeed - the higher-level object could not be reached in this way - and from this promising, almost phenomenological beginning he reverted to physicalism.

What is appealing about physicalism is the way in which it provides a covering model for almost the whole history of science up to the emergence - as yet tentative and misunderstood - of the human sciences, a model that still functions for the most recent discoveries in the natural sciences. It offers a view of that history as a process of aggregation, starting from modest beginnings. The modesty is important: science has suffered from the immodesty of some of its enthusiasts. Laplace has a lot to answer for with his demon, whose hubris opened the scientific enterprise to charges of arrogance and inhumanity, when it is in fact perhaps the most sublime of human achievements. One modest beginning finds Galileo rolling balls down inclined planes in Padua (not dropping them from towers in Pisa). He has a simple experimental apparatus, in which he has slowed down the vertical component of gravitational acceleration by making the incline sufficiently shallow so that elapsed times are sufficiently long to be measured by his water clock. And he devises a simple mathematical expression that relates the time after

release of the ball to the distance covered in that time. That's all: it is the confrontation and reconciliation of two different entities - the behaviour of the rolling ball and the mathematical expression of that behaviour. Not as easy or obvious as it looks - as Galileo makes clear, people had been offering mathematical explanations of physical behavior for a long time, they just hadn't bothered to do the exact measurements.

Limited episodes like this were repeated by different scientific workers investigating different natural phenomena - by more and more workers looking into more and more remote corners of the world. The process still continues. Some philosophers of science have denied that this represents anything like a linear progress. Certainly there have been and may yet be wrong turnings and retreats, but the pattern is of a steady aggregation of contiguous patches, as it were, with occasional imaginative leaps that bring apparently unrelated partial aggregations into a larger inclusive one. William Whewell called this 'consilience' ('jumping-together'), a term that has been picked up and run into the ground by the sociobiologist Edward O. Wilson (Wilson 1998). Perhaps the most brilliant move in the process of unification by aggregation was Newton's linking together of Kepler's celestial with Galileo's terrestrial mechanics, by his audacious and as it turned out correct conjecture that the moon might be a falling body. The patient matching of smaller or larger elements of the world with smaller or larger elements of theory (which are also in the world) has been the strength of the natural sciences. But the resulting edifice covers only what it covers, and is unitary only to the degree that remote as well as proximate connections have been established and inconsistencies smoothed out.

4. Gaps and continuities in the natural and human worlds

This admission of systematic incompleteness in our knowledge of the natural world is not, however, a concession to the view that that world may be a patchwork of interconnected structures with real gaps, a 'dappled world', to use Nancy Cartwright's evocative phrase. 'Our' world is epistemologically dappled all right, but that does not

mean that the natural world (of which our world is only a partial aspect) is ontologically dappled. There may well be some ontological dappling at the quantum level, but the claim that 'for all we know, most of what occurs in nature occurs by hap, subject to no law at all' (Cartwright, 12), seems inconsistent with the overall reliability of ordinary physical things and processes. If *most* of what occurred in nature were haphazard this would surely have repercussions at the everyday macroscopic level, and yet most of the explanations and predictions of the natural sciences in what I have called the 'flat region', in which space is Euclidean, time Newtonian, and causality regular, prove reassuringly dependable. (I cannot mount here a full defense of this claim against the melodrama of the Kuhnian view that these regularities have all been overturned - it is only far from the flat region, in the direction of the very small or the very fast or the very remote, that they have been displaced by their revolutionary successors. For a brief treatment of this point see Caws 2005, 1925.) Where ontological dappling enters with a vengeance is in the domain of the human sciences, of which more below. The parallel between physics and economics with which Cartwright opens the argument of *The Dappled World* seems to me to blur a distinction which, while often taken to be discredited, remains in my view of cardinal importance, although in its familiar form - as a distinction between the natural and social sciences - it is certainly problematic.

When I say that theories are also 'in the world', this mode of being 'in' the world is mediated by the subjectivity of the scientist. Some sociologists of science have therefore concluded that, as Steve Fuller puts it, 'the study of science should be conducted so as to be subsumable under a unified social science, which in its search for regularities and causal mechanisms will provide the basis for science policy' (Fuller, 3). Some ambiguities need to be teased out here. Is the 'study of science' doing physics, for example, or doing the philosophy or sociology of physics? Is science given as an object to be studied or is it the world that is given and 'the study of science' a way of talking about the study of the world? In the first case we would be aiming at knowledge of science, in the second at scientific knowledge of world. 'Knowledge,' as Fuller goes on to say, 'exists only through its embodiment in linguistic and other social practices. These

practices, in turn, exist only by being reproduced from context to context, which occurs only by the continual adaptation of knowledge to social circumstances' (Fuller, 4). 'Science' is undeniably a social practice, and the question whether such practices are susceptible of scientific treatment, and if so according to what model, is certainly worth asking. It is a question about social science. But the fact that scientists require to have been 'socialized' (learned language, learned to apply standards, learned to cooperate) does not mean that the objects they study have become infected with the social.

I would be inclined to modify Fuller's second statement in two small but significant ways: 'knowledge exists only through its embodiment in *particular individuals and its expression in* linguistic and other social practices. These practices, in turn, exist only by being reproduced *from individual to individual*'. The process of this reproduction I call a (special case of) instruction, a term I use in a technical sense to mean all the processes (genetic, epigenetic, experiential, experimental, cultural, autonomic) by which we acquire the inner structure that mediates our dealings with the world and one another. It remains the case however that what is embodied and expressed in scientific cases may not all be the same sort of thing, that knowledge of chemistry and knowledge of choreography may involve differences of content and level not easily subject to unification. At the very least there are differences of practice and hence of discipline. The socialized thinker can think what there is and how it is (roughly, the theory), and can also think what we know and how we come to know it (roughly, the discipline); the prior social conditions thus cancel out as far as the contrast between the two is concerned. The whole program of the sociology of science in fact seems to me properly directed to the disciplines, and to leave the theory untouched.

5. Physicalism and its limitations

To revert then to the theoretical unification of the natural sciences, from which we may hope to learn something about how a parallel (but very different) process might go on in

the social sciences: this unification has depended, not to be sure on the reduction of everything to physics, but on the acceptance of an underlying physicalism. The Milesian ambition to have everything made intelligibly of one sort of thing was first realized, crudely but correctly, by the old atomists in the fourth and fifth centuries BCE; it was reformulated by Gassendi (1592-1655), given its now familiar form by Dalton (1766-1844), and has survived all the way to contemporary particle physics and molecular biology. The split in physics between relativity and quantum theory (an ironic opposition of the two domains Newton had united) does not affect the efficacy of this unifying principle. What is hard for people to realize vividly enough, and to remember, is the sheer size of the numbers involved. An order of magnitude clue is given by Avogadro's number, the number of atoms in a mole of a given element or compound, a mole being originally the number of grams of a substance equal to its atomic or molecular weight. The standard is now the number of atoms in twelve grams of carbon 12, which is roughly 6×10^{23}, or six followed by 23 zeroes. Twelve grams of carbon is about the equivalent of one piece of well-burnt toast. This proliferation of particles holds everywhere, in the stars and the sun and the ocean and the brain; it has been estimated that the number of particles in the physical universe is on the order of 10^{85}.

Forgive all this numerical stuff - there's method in it! Everything in the world, from neutrinos to neurons, consists of particles, singly or in combination. There seem to be plenty of them to make up all the things there are. But then comes an awkward fact: particles can constitute sound waves but not utterances, texts but not their meanings, works of art but not their appeal, machines but not their uses. They can account for what Kenneth Pike called 'etic' properties but not for 'emic' ones (Pike, 37). They can get us to the top of the physical world, but not even to the bottom of the social world - or that part of it whose constitution and perpetuation depends on the mediation of thought. This is where consilience breaks down. And yet we are still in the same universe, and there is no evidence that there is any other basis for the being of what there is than particulate matter and the spatial fields associated with it. How do we get from the matter to the thought? People sometimes think of this as what has come to be called the 'mind-body problem'. I

take there to be two versions of this problem: the 'mind-dead body problem' and the 'mind-live body problem'. The latter dissolves if we suppose - as seems reasonable, given the complexity of the central nervous system, including the brain - that mental activities are natural functions of sufficiently complex live bodies. The former then reduces to what I call the live body-dead body problem - that is, the problem of the biology of complex self-replicating systems. This used to be just as big a problem as the mind-body one, which attracted solutions all the way from theology to vitalism - but hardly anyone thinks of it as a serious problem any more.

The route from matter to thought, then, seems obviously to lie through the stage of organized thinking matter that we call the brain. This does not mean mind-body identity in the philosophical sense - the utterance really is different from the soundwaves or the neurological events they stimulate. Still it is worth dwelling on the complexity of those events. I spoke earlier of 'the sheer size of the numbers involved' in coming to grips with the physical world, and similar considerations come into play here. The average human brain contains 10^{11} neurons, more or less continuously active. 10^{11} is a big number all right but it is the activity whose dimensions it is hard for people to grasp. Every brain event involves the passage of neurotransmitter molecules across synaptic gaps between neurons, all 10^{11} of which are multiply connected to many, many others. Exact numbers are hard to come by, either for the number of connections or the number of neurotransmitter molecules involved in each, but here's a telling anecdote from a lecture I once heard about just one molecule of one neurotransmitter, dopamine, whose docking at a post-synaptic receptor was simulated in a beautiful short film by Svein Dahl, a Norwegian neurologist. Dahl's film lasted four minutes. In his commentary he admitted that the details of this event were still conjectural, but he said he could assure us of two hard facts about it: first, that in real time it would have taken eighty picoseconds, or eight hundred-billionths of a second; second, that it had taken him four hours on the central processing unit of a Cray supercomputer to calculate its details. This is the sort of complexity that has marked every second of our cerebral activity since the womb and is

still busily at work, with its inconceivable speed and multiplicity, as we read or speak.

6. Natural sciences, social sciences, human sciences

I would ask you to remember these two levels of complexity, of the physical world at large and of that part of it we are carrying in our heads, as I turn now to the social sciences proper and hence (finally) more directly to the topic at hand. The conventional boundary between the natural and the social sciences, while I take it to be necessary and not easily erased, is I think badly drawn. The social sciences suffer from what might rather melodramatically be called a crisis of identity, aspiring on the one hand to be like the natural sciences, realizing on the other that they are something quite different. Let me make a preliminary distinction between two aspects of the social sciences, which may be called respectively behavioral and intentional. The objects of the behavioral social sciences belong to same domain as the objects of the natural sciences - what in an as yet unpublished paper I have called the first (or materialist) ontology, understanding 'ontology' in Strawson's sense rather than in Heidegger's (that is, as an inventory of beings rather than as a theory of Being). They yield to empirical inquiry and generalization, often statistical but forming a basis for predictions of voting patterns, market behavior, and the like. The objects of the intentional social sciences, on the other hand, belong to - *but do not exhaust* - a different domain, which I call the second ontology. The second ontology is emergent with respect to the first, in a quite specific way: it is made possible by the capacities of the human brain, in particular the powers of apposition and intention, which together construct by reiteration the lifeworld of the individual subject and, in mutual exchanges with other subjects, the human world - a part of which we call the social world.

A whole theoretical development would be required here, going far beyond the bounds of this paper. Perhaps I can illustrate the essential point by a citation from Wilhelm Dilthey's *Introduction to the Human Sciences* (the *Einleitung in die Geisteswissenschaften* of 1883,

in which Dilthey borrows from but radically revises Mill's concept of the 'moral sciences' and originates what I take to be a crucial and as yet not fully realized movement towards a developed idea of the 'human sciences'). Dilthey says: 'Mental facts are the highest boundary of facts of nature; facts of nature constitute the lower conditions of mental life' (Dilthey, 85). I called the first ontology materialist and it would be tempting to call the second idealist if it were not for the inevitable connotations of that term - we do live, informally speaking, in a world of ideas as well as things, but the ideas do not have the independent ontological status that 'idealism' suggests. It might be better to speak of 'second ontologies' in the plural, to avoid the error into which the original 'ideologists' fell, of thinking that ideas constituted a new natural kind - if geology, and biology, why not ideology? (There is no need here to go into the unfortunate subsequent history of the latter term. It may however be worth mentioning that the same error of reification was repeated later by the associationist psychologists, and has shown up even more recently among the theorists of 'memes'.) The whole edifice, the material base and the human superstructure (to borrow two terms that also have their old connotations, though I take them to be neutral enough to allow a different use) remains 'material' in the Milesian sense of 'matter', which in Aristotle's rendering is 'that of which all things that are consist, the first from which they come to be, the last into which they are resolved' (*Metaphysics* 983b8).

This Aristotelian formula is worth a moment's reflection: it allows for the possibility that non-material entities might 'come to be', and also for the possibility that the eventual resolution back into the material might be indefinitely postponed. I take it that this is what is happening with social and cultural objects - they require the material base (brains, soundwaves, texts and other artifacts) but can stay aloft, as it were, by being passed from subject to subject, from generation to generation, for a long time without being resolved back into it. (If all this talk of materialism makes people uncomfortable - because it seems to reduce or belittle the higher or spiritual side of human culture - I can only recommend the attitude of a wise old French biologist, Jean Rostand, who when asked whether he believed that thought came from matter replied 'Of course - but I have never

pretended to know what matter is'.) The crucial phrase here is 'from subject to subject' - in the singular. I affirm here a radical individualism in the human and social sciences - not methodological, however, but ontological. Margaret Thatcher's *bon mot* - 'there is no such thing as society' - was trivially right but at the same time misleadingly wrong; the ontological base is in the individuals, but if the individuals conjointly construct society, then there it is: for each of them. Each of us has a *whole* language, a *whole* society, etc. - that is the condition for speaking the language, for functioning in the society. No two of us have identical languages or societies. We may take the natural world to be self-identical, so that the natural sciences (which we may grasp just as idiosyncratically) should in the long run be self-correcting. But there is nothing self-identical to anchor the human sciences.

The emergent second ontology obviously looks very different from the material ontology from which it emerges, and it would be remarkable indeed if the theories and disciplines that deal with it could be simply articulated with those that deal with the physical world. That is where the old unity of science went wrong, namely in supposing that there exists (or subsists) a domain of social objects as it were 'out there in the world' analogous to the domain of objects dealt with by the natural sciences, on to which the apparatus developed in those sciences can be transferred, mutatis mutandis, so that work can go on more or less as before. This is a tempting supposition because in our lifeworlds the two domains do interpenetrate and overlap; we move comfortably in both and do not notice profound ontological differences between objects that are familiarly associated with one another. We recognize this time as morning but also think of it as Saturday morning; we notice that we are in a room but also believe we are in London; we meet one another as fellow human beings but also acknowledge one another as colleagues. These are different cases and would require different treatments if their details were to be spelled out: the room is an artifact in a way that days and persons are not, and in all three cases the *names* of the physical objects or states are just as intentional as the day of the week, the city (*civitas* as opposed to *urbs*), or the academic title. But the essential distinction is that some names name objects that do not require human intentionality to be the objects they are, while

other names name objects that do. And that is a distinction that blocks the easy transfer of methods from the natural to the human sciences.

7. Unification in the social sciences

What of unification in the social sciences - and pluralism? The remarks I made earlier about theories and disciplines seem to me to apply here: the various social-scientific disciplines have their own histories, their own heroes and founding figures (Adam Smith, Auguste Comte, Ferdinand de Saussure, and a host of others), their own learned societies, their own university departments and journals, just as the natural sciences do. What I have called 'first-order unification' seems to make as much or as little sense here as there, and to be subject to the same mixture of motivations. The question remains, then, as to whether there might possibly be a second-order or theoretical unification, a covering model that would do for the social sciences what physicalism has done for the physical ones.

Let me introduce one last large number - not that large, really, in comparison with the 10^{85} particles in the physical universe, but larger, I think, than we often remember or can fully take in, namely the number of human individuals - roughly 6.4×10^{9}, *each* with 10^{11} neurons, and also everywhere (in the biosphere anyway). It is what they do that makes the social or human world, just as what the particles do makes the physical world. You will notice that I am hedging here as to terminology - 'social' or 'human' - and I admit to a preference for the latter to describe the scientific theory that offers as I see it the best chance for a radical and unified understanding of the what I have called the intentional social sciences. Some, but not all, of the events in the human domain are mediated by elements of my second ontology; those that are not fall back into the province of the behavioral social sciences, which as I have suggested can be thought of as continuous with the natural sciences. The agents who participate in these events presumably *attend* to what they do, notice that they are doing it, but they often fail to *intend* it, except in the

ordinary-language sense of setting out to do something gratifying and hence perhaps predictable. But the elements of the second ontology are through and through intentional, in the Brentano-Husserl sense - they are objects created and requiring to be sustained by human subjects, calling for interpretation rather than measurement and calculation.

The human sciences, on which limitations of time and space prevent me from expanding further, are as I see it conceptually prior to the social sciences. Society is one, but only one, of the objects human intentionality has created. Every step towards society, every step for the modification or improvement of society, every new idea or creation, happens outside society and cannot be explained in its terms. But they are all explainable, along with everything else that happens in the human world, in terms of the powers and acts of individual human beings (along to be sure with their mutual connections to one another). This is not a reductive move - the explanation moves up through levels that are emergent with respect to what underlies them. In a similar way what happens in the physical world is explained by its material constitution (and subject to the same disciplinary limitations). Some writers have tried to exploit the analogy by borrowing physicalist terminology: 'Man, the molecule of society, is the subject of social science', says Henry Carey (1872, 77), while Jacob Moreno develops a typology of 'social atoms' (Moreno 1960, 57). This reading of the analogy is radically flawed: the objects of the human sciences are not human individuals, but all those things that human individuals create and sustain and share: languages, values, institutions, laws, cultures, myths, histories, theories, religions, performances, games, fictions, philosophies, and other practices and discourses. But the reading is not altogether pointless, because it reminds us that the operations of the human sciences are multiple and particular and distributed, and that all these objects come into and are sustained in being by separable and to a degree independent individuals - of whom however there are so many that the cointentional objects they share take on an aspect of almost material objectivity.

The prospect of unifying the intentional social sciences, as theories though not as disciplines, lies in my view in bringing them under the human sciences as a covering

model, taking account of the sheer numbers of the subjects who animate them, and acknowledging the radically individual and idiosyncratic character of these subjects. The stability, and hence the possibility of unification, of the natural sciences depends on the plausibility of a realist hypothesis, which attributes material reality to their objects as entries in the first ontology; the objects do not depend for their permanence on their being known by subjects, but are for the most part available for observation and checking to successive generations of subjects. The objects of some of the human sciences - notably linguistics and some aspects of psychology, anthropology, and sociology - seem to enjoy a similar permanence, but a realist hypothesis is not plausible in these cases, and the situation is even less stable in domains involving values, such as literary or aesthetic or moral theory. However in these cases there is an analogue of the realist hypothesis in what might be called the 'other-minds hypothesis': if I am not at a given time sustaining some intentional object - a linguistic form, a social institution - others probably are, and if there are enough of us it will become an element of a familiar world in common, just as natural objects do.

The social sciences, then, deal with those aspects of our common world that are so sustained - and which, if not so sustained, will pass away, as its natural aspects will not. The particular social sciences, corresponding to their very various disciplines, fall under the unifying umbrella of the human sciences (which deal after all with much that is not social in any obvious sense) as special cases. A final note, though: not all of the 6.4×10^9 inhabitants of the earth contribute to social objects and structures to the same degree and in the same way. This fact would seem to guarantee the persistence of pluralism.

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