Knowledge Places[1]

John Law

ESRC Centre for Research on Socio-Cultural Change,
Department of Sociology, Faculty of Social Sciences,
The Open University, Walton Hall,
Milton Keynes MK7 6AA, UK (j.law@open.ac.uk)

Plenary paper prepared for the workshop,

'Linking STS and the Social Sciences: Transforming 'the Social'?'
28-29th October at Kookmin University, Seoul, South Korea

This version was published by heterogeneities.net on 14th November 2011 at
http://www.heterogeneities.net/publications/Law2011KnowledgePlaces.pdf

[1] I would like to thank Mario Blaser, Marisol de la Cadena, Donna Haraway, Wen-yuan Lin, Annemarie Mol, Ingunn Moser, Hugh Raffles, Vicky Singleton and Helen Verran for debate and discussion of the issues explored in this paper.

Introduction: a sense of place

Thank you for your kind invitation. It is an honour to speak to you today.

STS grows through change, and a crucial source of that change is *difference*, for it is in difference that we learn that what we took for granted needs to be questioned. So the growth of a vigorous STS in East Asia, indeed in countries such as South Korea, will be profoundly good for STS as a whole. Obviously it will shift the centre of gravity of the field, and the ride will no doubt be bumpy and perhaps sometimes uncomfortable. In Europe and the US we will need to unlearn some of the things that we thought we knew. And you will need to make new things for STS. But, of course, the analogous challenge for you will be to create your *own* STS. It will, in particular, be crucial to avoid simply adopting the orthodoxies as these have grown up in the north or the west. Your STS will need to respond to your own challenges. And it will need to draw not only from existing STS traditions, but also from cultural, intellectual and philosophical resources specific to Korea. All this means that the future for STS is exciting, it is unpredictable, but it will not, it *should* not, look like the past.

If I might put it in a slightly different way, this means that we will need to develop a much stronger sense of *place* in STS. For, here's the point, STS is created in *places* and those places are different[2]. So it isn't created everywhere equally, and neither is it created *nowhere*[3]. Already, and even within the West, I sense that we often get this wrong. For instance, it's true that North America and Europe share much. But they don't share everything, and sometimes we forget this, just as native English speakers tend to forget that not everyone speaks the currently imperialist language. Sometimes we forget to locate ourselves. And sometimes it's being assumed that agendas that aren't ours are of general interest when they're not. So this leads me to a health warning. Like everyone else I come from a place too. *Intellectually* I come from a location which I call *material-semiotics* though if that term sounds unfamiliar you can call it *actor-network* theory[4]. This means that I don't belong to the sociology of scientific knowledge, SSK, or the social construction of technology, SCOT, and sometimes, not always, the difference here is important. Geographically I am, of course, British and European, with the various agenda-setting complexities that this implies. And generationally I have been in STS and its precursor movements for over forty years which means that I've had the chance to watch the field grow since its inception. So, that's the health warning. If this is an overview (and I'm don't think it is, I don't very much like overviews) then it is an overview from a particular location.

A crisis of normativity?

All that said, here's the argument that I want to make. From where I stand it seems to me that *STS is suffering from what we might think of as a crisis of normativity*. That's not a very attractive term, and I'm not attached to it. But I put it this way because I want to flag up an issue that stretches over and combines the normative in politics, ethics, *and* policy. However, the overall sentiment, the origin of the crisis, is that in one way or another many in English-speaking STS feel that it isn't useful and it

[2] Doreen Massey powerfully notes that unlike time, recognition of space preserves the possibility of significant political difference. See Massey (2005).
[3] Donna Haraway (1991b) refers to the idea of seeing everything and speaking from nowhere as the 'God trick'.
[4] The term 'material semiotics' come from Donna Haraway (1991a) .

needs to be useful. Indeed, some would say that it's a scandal if it *isn't* able intervene and make a difference in the world. They have come to think that *describing* isn't enough any more

I have good friends, mainly political radicals, who have always taken this view. And there are strands in STS that have always been political too. Strong Marxist and feminist threads in the weave of Western STS have done remarkable work. The political economists and the feminists were *always* political. So my remarks aren't addressed to them at all. Rather I am thinking of the two intellectual traditions – I would suggest the two *major* – intellectual traditions that have defined the core of Euro-American STS over its forty year history. I've already mentioned them. They are SSK (including SCOT) on the one hand, and actor-network theory (or 'material semiotics') on the other. It's in ANT and SSK and their related approaches that the crisis of normativity has struck most obviously. Suddenly there are people in these traditions who are saying: we *ought* to be normative or political or relevant. And they are rushing to *become* normative or political or relevant. And, this is the argument I want to make, I think they are going about it in the wrong way.

So why has this happened? How has it come about? To answer these questions I will talk, just briefly, about the history of European STS and how it is that SSK, the sociology of scientific knowledge, and ANT, actor-network theory, grew up. I will briefly tell origin stories. SSK first.

What is the scientific method? Back around 1970 this was the core problem for SSK, the problem that brought it into being as it struggled with the philosophers of science, the *epistemologists*. Epistemology covers a wide range of approaches, but its concerns are almost always *prescriptive*. Epistemologists work on the assumption that science is privileged. In one way or another they assume that it is especially good at establishing the truth. Perhaps, for instance, it is particularly logical and experimentally rigorous. So epistemologists look at science and try to work out the rules of good scientific method. So that was SSK's enemy. It *didn't* think that science was a set of special rules of method. It didn't try to set up norms for science. Instead, and the story is well known, it followed Thomas Kuhn's version of the history of science[5]. It argued that in practice scientists use specialised cultural resources (Kuhn's 'paradigms') to define and solve practical scientific problems. The SSK insight was that *scientific knowledge and scientific method are just specialised forms of culture*.[6] That's all.

At the time and for a long time afterwards, this was a scandal. Defenders of science were horrified and went on insisting that it is special and distinctive. Indeed SSK was accused of undermining the authority of science. But what's important in the present context was a single and straightforward feature of SSK. This was that it was essentially *descriptive* rather than *prescriptive* in character. The epistemologists were normative. They needed to distinguish between good and bad science. But the creators of STS made no such distinction. Indeed they actively resisted it. It didn't matter, they said, whether the scientists in question had got it right or not. The same *kinds* of processes underpinned both good and bad science. So they adopted what David Bloor called the 'principle of symmetry': you try to explain *all* kinds of scientific knowledge, true and false, in the same *terms*.[7]

[5] Kuhn (1970).
[6] For important work in SSK see Collins (1975), Bloor (1976) and Barnes (1977).
[7] For this argument see Bloor (1976).

If you want to be clever you can say that the principle of symmetry is a form of normativity. After all, the prescription to describe rather than prescribe is itself a prescription. But hold onto the simpler version of the story instead. This is that SSK taught a generation of STS students that they shouldn't take sides, but that they should simply describe. Shift now to ANT, and you discover the same imperative. Indeed, you find almost the same language at work. When Michel Callon started looking at the relations between scallops and fishermen and scientists he said that if we wanted to understand how their relations got themselves configured then we should adopt what he called a principle of *generalised symmetry*.[8] His enemy – and that of ANT – wasn't the prescriptions of epistemologists. Instead it was the assumption that *divisions in the world are fixed and given*, whereas ANT's argument was precisely that they aren't. That, for instance, there is no fixed foundational distinction between human beings on the one hand, and non-humans on the other. Instead, it argued (it argues) that entities of all kinds are *effects* of relations, and since relations are variable, at least in principle, then so too are the entities that those relations generate. If there are distinctions between the human and the non-human in practice then this is an *effect of the networks of relations in which they are located*. And, a point to which I will return later, the same is true for other supposedly foundational distinctions.

This was (and no doubt still is) a second STS scandal. Anyone who is committed for any reason – ethical or political – to the basic distinction between human and non-human is horrified, and there were long and heated debated between SSK and ANT on precisely this issue. But what's important in the present context is the fact that in one particular respect ANT was very close to SSK. This is because, *like the latter, it was seeking to describe rather than to prescribe*. Like SSK, it was a methodology for *describing* the world without assuming too much about what it would find as it went about its task. And this meant that it certainly wasn't well adapted to taking sides in whatever it happened to be looking at.

All of this is too simple. As I have already said, there were other threads running through STS. But by now I hope that I have made my basic point, and it is this. At least two of the core approaches in STS were methodologically *descriptive rather than prescriptive*. Indeed, and more strongly, *they both argued that prescription was likely to get in the way of description*. So prescription was out.

Which brings us to the crisis of normativity. For, let me simplify, if we fast-forward twenty years we find that the two approaches that lie at the heart of STS still have a non-normative understanding of science and technology. At the same time, they are beginning to feel uneasy about this. Indeed, they are beginning to experience what we might think of as a *normative deficit*. So why is this? What has happened?

I don't want to talk about this in detail today, but if I briefly allow myself to speculate then I think a large part of the answer lies in the declining and uncertain status of technoscience in both North America and Europe. In one way, then, it is about the decreasing power of particular forms of expertise. Do we trust technoscientists to make wise decisions about (say) nuclear power, medical interventions, or the proper content of biology textbooks? For a variety of reasons the answer is that this is no longer obvious. And those reasons range from the growth of environmental protest movements, through increases in individualist versions of patient power, to the growth of the religious and creationist right in North America. But whatever the reasons, this has put descriptive

[8] See Callon (1986). For a general account of the actor network approach see Latour (1987).

STS on the spot. Descriptive debunking might have been okay when technoscience was an incontrovertible source of authority. There *was* no room for argument. Everything else being equal, technoscience was *right*. But now, in a world where citizens have views about the results of technoscience and its interventions, it's a little uncomfortable for STS to sit there saying: we merely *describe*. To the extent that anyone takes any notice of STS at all, we feel that we're being asked to take sides by policymakers, by patients, and by beleaguered scientists. And *that's* the crisis of normativity. Description by itself will no longer do.

A politics of due process

So how should STS respond? How *does* it respond?

One response is to make no response. Lots of descriptive studies that have little or nothing to do with normativity are still appearing in the pages of the journals. Then again, the radicals are still interfering (and I'll return to the work of one of the most important STS writers in this tradition, Donna Haraway, in due course). In addition, there's a lot of work about the democratisation of technological decision making. The idea is that, one way or another, more citizens can and should be involved in decision making processes; that, indeed, experts can and should be cut down to size. There's work, too, that in one way or another responds, or tries to, to the exigencies of policy makers. But what interests me most is that some significant STS attempts to respond to the normative deficit have taken a more or less *constitutional* form.

What's the guiding idea? The answer is that STS shouldn't take sides directly. It shouldn't intervene (for instance) in debates about the desirability of MMR vaccines or nuclear power or Creationism. But what it *should* do is to come up with proper *procedures* for settling differences. Thus what we might think of as the *new normativity* in STS has become quasi-legal in form. STS handles the normative deficit by attending to *due process*. It creates and attends to rules that distinguish good outcomes from those that are bad. And what's interesting – and concerning – is that *both* the SSK *and* the ANT traditions are working in this way. So let me give you a sense of the argument.[9]

SSK – for instance Harry Collins and Rob Evans – tackles the issue by trying to distinguish between *different kinds of experts*.[10] The argument is that every social group has *some* kind of relevant expertise, but if good decisions are to be made then you need to distinguish between the forms of expertise. Thus faced with a controversy, some experts are qualified to make highly technical judgements because they have embodied competences, cultural understandings, and hands-on sets of skills. Other experts have *some* of these, while yet others know, for instance, all about how it is that life is lived on the ground, which is relevant but not in the same way. The argument is that pretty much everyone involved in a controversy is expert in one way or another, but the character of their expertise needs to be sorted out, since different groups properly play different roles in controversies. So that's the normative prescription, the rule that defines due process. Recognising that there are many forms of skill, SSK is telling us that *controversies should be settled by proper experts with the appropriate skills*. And STS comes in here again too, because it is probably STS that has the expertise to distinguish between different kinds of experts.

[9] For a slightly fuller version of this argument see Law (2010).
[10] Collins and Evans (2002; 2007).

So that is due process according to SSK. But ANT is travelling a similar route. Remember that ANT is about *relationality* and that people are *effects* of relations. This means that you can't start with experts but you need to go further back. You have to start with the relations that produce (or don't produce) realities and objects and people of one kind or another. This, at any rate, is how Bruno Latour sets up the problem[11]. So you have a series of different sciences and their realities and a series of different social sciences and political arrangements all being generated – but this means there is too much. Bruno Latour talks about a '*pluriverse*'. So after this multiplicity there is a strain to the singular, to a common world, to a *universe*. And what is most important in this process is whether a (revisable and provisional) *collective* can somehow be generated so that whatever has been created can live together[12]. But how is this to be done? The answer is a slow, deliberate, and appropriate process which explores, develops, revises and selects particular realities and particular identities and provisionally fits them together. Latour refers to this process – or more precisely the rules that govern it – as 'constitution'. Obviously the rules of the constitution are not the same as the SSK commitment to proper forms of expertise. Nevertheless, the same root metaphor is at work. In both: we are in the realm of *due process*; we don't take sides on particular issues; we use *methods* to address the normative crisis; and we are being told that we need to *sign up* to due process. *The normative deficit will be eliminated*, or at least it will be minimised, *if we just follow the rules*. That's the argument that's coming from the core of STS.

I can see the temptation. We've spent forty years describing, and more description isn't going to address that normative deficit. Something different is needed. But, here's the problem: *adding in rules isn't going to work either*.

Why? There are various reasons for this. First, however good they may be, *rules get broken*. But the descriptive work of SSK teaches us an even stronger lesson. Think back to its arguments with epistemology. Epistemologists said there are rules for doing good science. But SSK said there aren't. Indeed it showed that there *are* no general rules for doing good science. It showed that science is a set of puzzle-solving practices, but that what counts as good practice changes over time. Or, again, that good science and bad science are generated in much the same way. Or, again, that what counts as 'following a rule', itself depends on context. It showed, in short, that rules don't guarantee a satisfactory outcome. And this is why I find it surprising that parts of STS have decided that rule-following, due process, or constitutions are the answer. It is as if we had forgotten our history.

A politics of arrangements

So what to do? Here's my suggestion. I think that we need to go back to the descriptive and think again about what it actually *is*. This is because STS has also taught us that *description is already normative*.

The basic argument can be expressed in two short steps. One: *to describe a scene or a process is to (try to) arrange it in a particular way*. And two: *to arrange something in a particular way is to be*

[11] See, for instance, Latour (2004a).

[12] Their idiom is a little different, but Michel Callon and his collaborators make a material-semiotic argument that is similar to that of Latour. See Callon, Lascoumes and Barthe (2009).

normative because it could be arranged differently, and that difference might be better or worse.[13] Normativity, then, is about good and bad arrangements, and it is about putting alternatives into play. And it is embedded in description.

This lesson comes from various STS places, but I'll make the argument through material semiotics. So, for instance, Bruno Latour writes that it is better to attend to *matters of concern* rather than to think in terms of *matters of fact*.[14] This is because concerns are relational, whereas facts appear to exist all by themselves. But perhaps the material-semiotic writer who makes the point most clearly is Donna Haraway. Language, she consistently reminds her readers, is about making connections and disconnections. And then it is about making some connections so obvious, so self-evident, that they come to seem natural and given in the order of things so that no one thinks of challenging them, or indeed has the resources to do so. And finally, here's the radical move, it is about undoing those self-evident connections and re-doing them in ways that enact other and better relational possibilities. Indeed Haraway's work has often been about unmaking apparently 'natural' realities by putting alternative metaphors to work[15]. (The feminist, anti-racist and partially but only partially integrated '*cyborg*' is perhaps her most celebrated example.) From which we learn, to put it simply, that *describing things is never innocent*. On the contrary, *describing them is also a normative act*.

All this applies to STS too. How we go about describing things in our discipline is necessarily normative. It is ethical, it is political, and/or it is a form of policy. So, as I earlier noted, the division between description on the one hand, and the normative on the other, is *itself* a normative act. And this descriptive normativity of STS precisely explains why there is political, moral and ethical unease about STS, and particularly about ANT and its successor projects, since these tend to undo a series of distinctions that are foundational in most Euro-American orderings of the world. Here's a small list of some of those claims.

1. I've already mentioned the division between *human and non-human*. If this exists at all in the material semiotics of ANT, it is an effect and does not exist in the order of things. And since for many this is profoundly disturbing political or ethical mistake, this is a reaction that immediately reveals that it *is* a normative move, good or bad. Descriptions and facts are obviously about values too.
2. In ANT the divide between the *social*, society, and the *non-social* is undone. This either makes sense (after all, in this way of thinking machines or animals join together in relations with people and the differences arise in practice), or it doesn't, because (this is the alternative view) the social is special and distinctive.[16] This is another argument, then, that is simultaneously about facts and values.
3. Much the same applies to the related division between *society* and *nature*. Is nature separate from society or not? Is it 'natural', so to speak pure and untouched by the social, or

[13] In a relational world there is no unsituated location which can determine goods and bads. Everything that is said about the reality relations applies just as much to normativities.
[14] Latour (2004b).
[15] See Haraway (1991a), but for a fascinating account in primate research see Haraway (1989).
[16] Actor network theory sometimes talks about the heterogeneity of the social. See Law (1986). For more recent revisiting of the notion of the 'social' see Latour (2001).

is it not?[17] Which, you'll straight away see, raises a series of political and ethical questions, more facts and values all ravelled up together.

4. Then, and perhaps more important for sociologists than many others, there is the issue of the divide between the *micro* and the *macro*. Are they distinct? Are they effects of relations?[18] Can and should the division be undone? Is denying the division except as a relational effect a refusal to deal with power, as is sometimes claimed? These are some of the questions, analytical and political, that emerge here.
5. And then, I'm particularly interested in these, there is a series of metaphysical assumptions embedded in Western or Northern common sense that are also treated as effects in ANT rather than as foundational. So, for instance, there is the relation between knowledge or *description* on the one hand, and the *reality* that is being described on the other. Mostly in Western metaphysics these are held apart. The reality out there is said to come before any attempt to describe it and generally held to be independent of it. And then, so runs the argument, the descriptions, more or less satisfactory, follow on, and we find ourselves in the realm of epistemology. But in ANT's relationality this doesn't follow. Reality and description go together, which makes for a metaphysical scandal, at least amongst those who care about such things[19].
6. And finally, another metaphysical question: this is whether there is a single reality out there, or whether realities are multiple. Mostly in Western metaphysics – and in Northern common sense too – it's assumed that indeed there's a single reality out there. Perhaps this is something like a time-space box which contains objects, events, processes and people. Us. This tells us that we're all part of a common world. But as I've already observed, this assumption gets eroded in the material semiotics of ANT and its successor projects. The argument is, first that realities and their descriptions are relational effects; and then two, there are likely to be lots of these because there are lots of different practices[20]. We move from a universe to a multiverse – which is a scandal in most Western thought, though perhaps not in some Eastern metaphysics.

We no doubt have different views about the merits or otherwise of these different understandings of the world. But we don't need to get into these, because my root point is much simpler. Descriptions, I'm saying, are already normative. They already slice the world and form it in specific ways. And since there are always alternative ways of slicing and dicing realities and these bring their own goods and bads, it follows that the normativities necessarily go along with the descriptions. Once the relational argument takes hold there is no way in which it is possible to separate facts and values. So, here's the point: there *is* no normative deficit. Normativity in the form of politics, policy and/or ethics is being done anyway. And this suggests that what we need is to develop tools for thinking about this, rather than creating forms of due process that will only be followed in the breach.

[17] This is an issue extensively explored not only in STS but also by anthropologists. See, for instance, Raffles (2010).
[18] The argument was first made in ANT by Callon and Latour (1981).
[19] I explore the metaphysics of relationality in Law (2004).
[20] See Law (2004), but also in particular, Mol (2002).

Knowledge places

Let us think, then, about the *tools of association*.

I use the metaphor of 'tools' not because it is innocent – no metaphors are innocent – but because I want to stress that there are no final answers and that there is no overall framework. We are where we are, located wherever it is we happen to be located, and we have problems, puzzles, versions of realities and normativities to deal with. And this is why we need tools to think about forms of association, though what those tools will be and whether they are useful will indeed depend on where we are, what the problem is. So it is with this situated sentiment that I want to conclude.

Here's the reasoning. Politics (or ethics or policies) are powerfully conducted in and by non-linguistic means. (The list of ANT-derived divisions that I have just discussed is powerful in part precisely because most of the time they aren't spelled out and are indeed simply taken for granted.) But, that said, articulation is a powerful site for politics. It renders normativities discussable and contestable in ways that open up the possibility of change[21]. So here's the question that I pose myself. Given the lessons that STS has taught us, what can we say about the *kinds* of things that forms of knowledge do? To which I add two further questions. What can we say about how it is that some forms of knowledge – think of technoscience, or Christianity, get themselves so *deeply embedded* that they become naturalised and obdurate, difficult or impossible to shift in particular locations? And what can we say about the tactics or strategies for making changes and *undoing* obduracies?

So those are my questions, and it's in response to these questions that I want to talk of *knowledge places*. So what is a knowledge place? Here's my suggestion. We might think of it as the *sum total of what's implied in a form of knowledge*. Notice, before I go on, that my definition is deliberately vague. It allows me to talk *both* what any form of knowledge *depends on* – what it is that feeds into it and sustains it – *and* what it *does* – its *effects*. It works, as it were, in both directions. Though (let me quickly add) given the relationality of object and context in the world of material semiotics, the distinction between the two is often vanishingly small. So, let me repeat the question: *what's implied in a form of knowledge*? What is it that makes up a *knowledge place?* I have four suggestions[22].

1. Most obviously knowledges imply *representations*, or something like them: they imply something that is *present*, that somehow or other '*knows*' or stands for things, aspects of reality, phenomena, that are not present. So representations such as scientific papers, talks, graphs, statistics and pictures, all of these know or stand for other phenomena. That's the easy bit. But we need to stretch the list a bit, for so too do, for instance, the habits of perception and the skills embedded in people. So, for instance, my body knows about the car and the road when I am driving. These objects and processes 'out there' are present, so to speak, 'in here' for anyone who knows how to drive a car. Arguably, though I don't want to get hung up on this point here, the same can be said for instruments, gadgets and devices: they too 'know' the world to which they relate.
2. If knowing implies something that is present 'in here', then (indeed I have said this) this implies something 'out there' that is known and known explicitly. Whatever it is that is described,

[21] The point is one that has been made by many. Donna Haraway talks, for instance, about the importance of what she calls accountability. But in STS see, for instance, Barry (2001).
[22] What follows in part draws the arguments developed in Law (2004).

graphed, counted, drawn, or visualised is explicitly out there, at least for the moment. It is being made *manifest*. Whatever is handled or seen is out there too. This is a little trickier. Is it being made 'manifest'? Well, the answer is that it all depends on what we mean by 'manifest'. Again, I don't want to get too hung up on this either, because the boundary between what is manifest and what is not is permeable and moveable. Something out there that wasn't noticed may become interesting and so rendered explicit 'in here'. And something that was represented may fall from view. There is traffic in both directions – and indeed the politics that I am trying to work with this 'knowledge place' tool precisely works, if it does, because it makes explicit parts of what were previously merely implicit knowledges

3. So knowing implies something in here that knows, and something out there that is known more or less explicitly. But this leaves a third large category, that which is implied in the process of knowing, but is neither present nor manifestly absent. Elsewhere I have talked about this by describing it as 'the Other'[23] but I now think it is useful to divide this by talking about the *practical* on the one hand, and the *metaphysical* on the other. First the practical.
   The practical covers both the social *and* the material. Think for a moment about what it takes to publish an academic paper, say in STS. The author needs time. She probably needs a job in a university or some such similar institution. She needs a level of professional training. She needs to be able to write in an appropriate language. She needs to have access to a library and to research materials. She probably needs colleagues to talk with. She needs a journal and all the apparatus of editors and referees that come with that. And then she needs, or at least hopes for, readers who, like the referees, will take what she is saying sufficiently seriously to read it. So, implied in all this too, is an authority claim: that she, the author, knows what she is talking about, and that her 'in here' adequately represents an 'out there'. And then, as a part of this, there is an audience that grants authority to the author. Or, of course, fails to do so. All of this, then, is social in the conventional sense of the term. But then we need to add in the material too. So, for instance, there are electronic media, computers and systems of transport. There are printing presses and data bases and computing languages that sustain (for instance) file formats. There are programmers that create and support the software. There are electricity utilities that supply the power that keep the systems of information going. And then there are publishers that sell journals to libraries, and have the resources and capital needed to publish journals. And systems of accountancy – and capital – that keep these enterprises afloat. The list, as you'll see, is endless[24]. And that is the point of talking about 'the *practical*'. For the practical, understood as material and social all ravelled together, is implied in endless ramifications in any form of knowing. It is a web, unknown and limitless. And, here is the important point, that is how far knowledge places extend. In principle they go on for ever, and they and they imply for more than what we usually think of as knowledge.
4. After the practical there is the final category, the *metaphysical*. And here I can be brief because I have already described this. Knowledges places do implicit metaphysical work; that is the point. They chop the world up and assemble in ways that are partially explicit but also, and arguably far more powerfully, in ways that are implicit. Taxonomies and divisions and generated and sustained, mostly without explicit attention. And we have seen some of the divides that turn up in many Northern knowledge places. Nature/culture, social/biological, macro/micro,

[23] Law (2004).
[24] For the argument worked out empirically, see Law (2011a).

human/non-human, society/technology, these are some of the metaphysical divisions that I earlier mentioned. And then there are the framing metaphysics that I also touched upon: the idea that there is a reality out there that is separate from the process of knowing it; the idea that this reality is independent, that it existed before we got to work knowing it, and (for me most important) the idea that there is a single reality – what I have come to think of as a 'container reality' – a universe within which we are located that frames existence.

So that's the list: (1) there's whatever is *in here* that is *known*; (2) there's whatever is *out there* and *known* more or less explicitly; (3) there's the catch-all that I am coding up as the *practical* that includes institutions, authorities, systems of exchange, and the materials that are embedded in these; and then (4) there are *metaphysics*, the framing assumptions implied and re-enacted in the business of knowing. That's what's implied in what I am calling a 'knowledge place'[25]. And I'm putting them together because they are typically held apart, but in practice to know at all is to imply and to buy into *all four in one version or another*. I don't like the language, but to make the point dramatically, I might say that we when we know we *choose* to imply, to include, and to draw upon specific versions of representation, the known, practical ordering, and metaphysics. We *choose* to reproduce specific normativities, policies and ethics. All in all, whatever it is that we know, we are doing a whole lot else as well.

Conclusion: a sense of difference

So, and to summarise, I don't think that STS has a normative deficit, and I tend to the view that its normative crisis is an unnecessary panic attack. And, since the descriptive history of STS tells us that practices are never governed by rules, it seems to me pointless to propose versions of due practice in the hope of securing proper outcomes. Instead I've been proposing that we attend to the embedded normativities and politics of our STS. And this, for me, is the point of the notion of the *knowledge place*. We do so much with our forms of knowledge, this is my argument, that it makes some sense to try to create a checklist for thinking about the kinds of things that we are doing, a checklist that will help us to make small parts of it explicit so that they can become contestable. The virtue of the checklist, I hope, I believe, is that it asks us to attend to things that we usually think of as quite separate: institutions and technologies; metaphysics; particular descriptions of the world; and whatever it is we are describing.

So that is the message. But I can end in one of two ways, either pessimistically or optimistically.

Here's the pessimistic ending. If we're interested in change, if we are interested in radically different forms of knowing and the radically different versions of the world that might go along with that knowing, then we face an uphill battle. This is because we're caught in what one might think of as a quadruple lock[26]. By which I mean that *all* the items on the list – institutions and technologies, metaphysics, particular descriptions and the things that we are describing – need to be altered simultaneously if we are to achieve certain forms of radical change. But, here's the problem, they all interlock with one another. Specific forms of knowledge and their objects are embedded in institutions and in metaphysics too. So, for instance, to know and to engage in debate in the most obvious ways is also to reproduce the most obvious institutional forms, authorities and metaphysics,

[25] I explore this argument in a somewhat different idiom in Law (2011b).
[26] For another version of this argument, see Law, Ruppert and Savage (2011).

And changing these together would require organisational, social, material, and metaphysical reworking all at one go. And if you don't think that this is uphill work, then try talking to, say, the people at the World Social Forum as they struggle to contest the politics and the knowledges and the metaphysics of the G7 and you will get a sense of the scope of the problem.

So that's the pessimistic way of thinking about it. Knowledge places extend in so many different and interlocking ways that trying to do them is close to impossible. But let me end on a more optimistic note. If, as I briefly suggested earlier, reality relations and the practices in which they are implied are multiple then this suggests that the knowledge places don't come as seamless wholes, but instead with gaps and interstices and cracks. This suggests that they may not be as obdurate as the pessimistic story might suggest. And here, I think, there are straws in the wind. Thus though I haven't discussed this, there is work on the technoscience practices of the north which suggests that even in locations such as biomedicine different practices and representations and objects exist, co-exist, and routinely intersect with one another. The implication, of course, is that different normativities, politics and ethics co-exist and intersect with one another too; and that, if we can make parts of these explicit then they become debatable and contestable[27]. And then there are similar stories, too, about difference, in the places where Northern technoscience encounters alternative post-colonial knowledge traditions. Such encounters are saturated with power, for sure, but again they bring different realities and different normativities into contact with one another – and sometimes, at least, the self-evidences of technoscience are undermined[28].

The optimistic conclusion allows me to return to where I began. I said, you'll remember, that STS will be strengthened to the extent that it encourages difference. It will be stronger if its scholars in a country such as Korea assimilate and reflect on not only the Euro-American traditions of the discipline but whatever is different and distinctive about the Korean experience. But now it is possible to strengthen this thought. Though I know little of Korea, surely studies like Robert Oppenheim's *Kyŏngu Things*, suggest how we might start to think about this[29]. It must be the case that the knowledge places of Korean STS are in some measure unlike those of, say, the UK. Your topics and your problems will be different, and the same will be true for your institutions and your metaphysics. No doubt the supposed universals of globalisation are being urgently pressed on you. We are, I know, in many ways caught in the same league tables. But I return to my original point. We will be stronger if our knowledge places are multiple. Not entirely different, but not the same either.

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[27] This argument is developed by Mol (2002), who talks also of what she calls 'ontological politics'. See Mol (1999). For a further striking case study, again from health care, see Moser (2008).
[28] See for instance, Verran (1998; 2001). But analogous arguments about difference can be found in postcolonialism. See, for instance, Blaser (2009), de la Cadena (2010), Escobar (2008), Feit (2004), Noble (2007) and Thompson (2002). For a version of the argument explored in a Taiwanese context, see Law and Lin (2011).
[29] Oppenheim (2008).

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